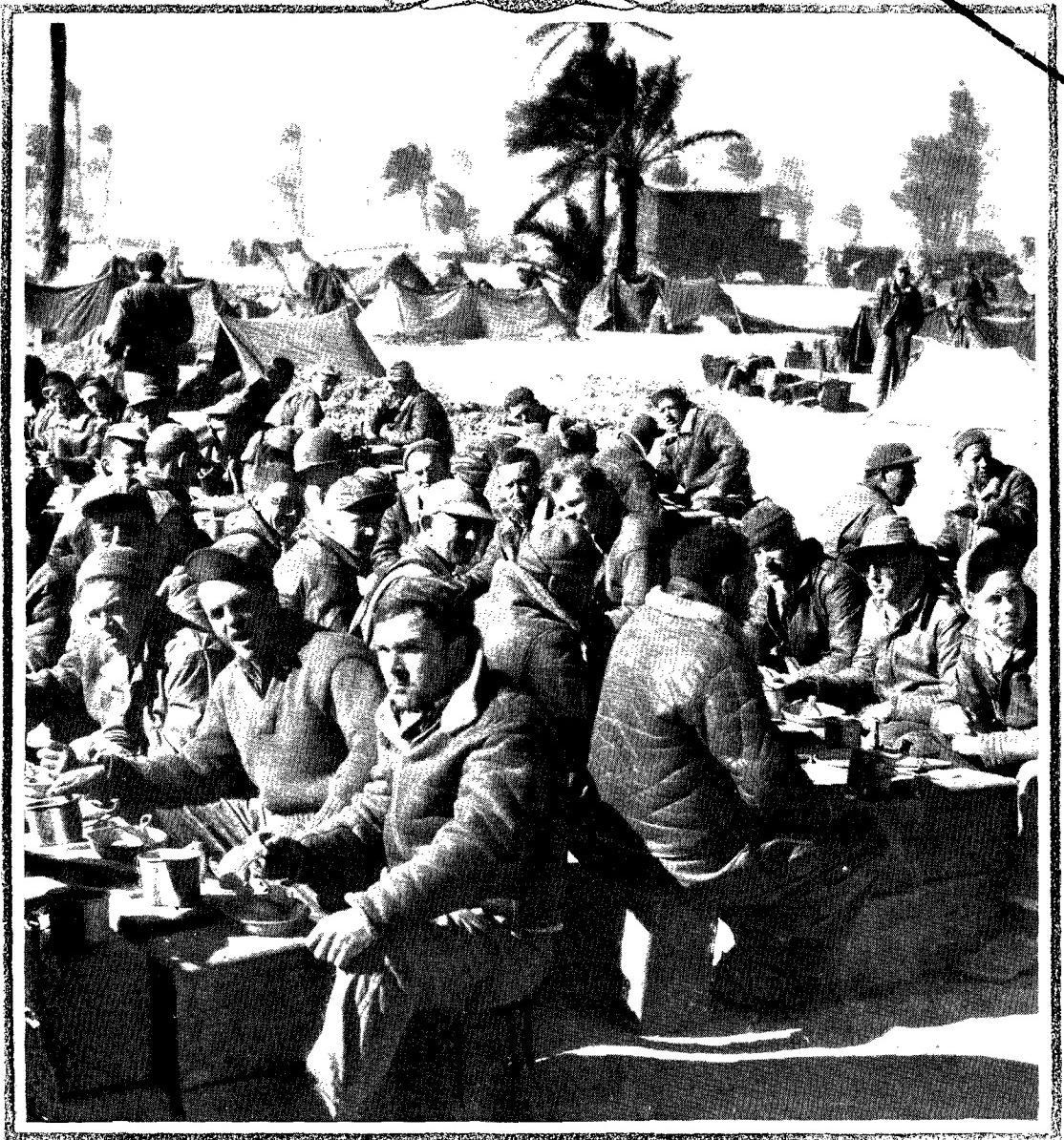


AIR FORCE

OFFICIAL SERVICE JOURNAL

OF THE U. S. ARMY AIR FORCES



JULY 1943

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AIR FORCE is primarily a medium for the exchange of ideas and information among Army Air Forces personnel. Opinions expressed by individual contributors do not necessarily express the official attitude of the Army Air Forces or the War Department.

July Brief

AS THIS ISSUE of AIR FORCE goes to press, the British Air Ministry announces formation of a tactical air force for all home-based aircraft of the RAF. The new command, which has absorbed the RAF Army Cooperation Command, is a direct outgrowth of the highly successful role played by the Northwest African Tactical Air Force in driving the Axis forces out of Africa. This role is described fully by Brigadier General Laurence S. Kuter, who served as American Deputy Commander of the Northwest African Tactical Air Force, in the article, "Air-Ground Cooperation in North Africa," appearing on Page 4. General Kuter formerly was Deputy Chief of the Air Staff. He prepared this article while in Washington on temporary duty following the surrender of the last remnants of the Axis forces in Tunisia.

THREE OTHER FEATURES in this issue of the service journal reflect additional phases of AAF participation in the North African campaign. The co-pilot of a heavy bomber describes his thoughts and experiences during the first AAF raid on Naples in an article on Page 7. The story of how ground crewmen of a B-26 Group had to use every stunt in the book and then some to keep their planes in the air during the early days in Tunisia is told on Page 12 in an article by Lieutenant Gordon H. Coc. This month's cover, showing men at chow in North Africa, is augmented by two pages of pictures (19 and 20) depicting the life of AAF personnel at our airdromes and bases in that theatre.

WHILE THE CLEAN-UP of the Axis forces in North Africa has permitted a decided increase in Allied air attacks on southern Europe, there has been an even greater acceleration of American and British raids on the continent from bases in the British Isles. Aircrew members who may be picked for the assignment to Britain will be particularly interested in "Have the Best Crew of Them All," on Page 14. In this article five members of a B-17 crew—pilot, navigator, bombardier, radio operator and top turret gunner discuss their specialties based on experience gained in bombing raids over Europe. The co-authors, members of the first bomber crew returned as a unit from the European theatre, completed OTU at Walla Walla, Washington, last summer.

THE GLOBE-CIRCLING civilian pilots of the Air Transport Command are described on Page 9 in

an article by Colonel Harold R. Harris, Commanding Officer of ATC's Domestic Transportation Division. The author reports that their uniforms aren't well enough known by AAF personnel and suggests that these carrier contract airmen be recognized as veterans who probably have "forgotten more about flying than you'll ever know." Colonel Harris, a pilot officer in the first World War and former test pilot, tells of sample experiences ATC pilots have had in the months they have been operating the round-the-world service. When Colonel Harris was recalled to active duty with the ATC he had been associated with long-range commercial air transport since 1928. Several years earlier, he had been chief of the flight test section of the Air Corps Experimental Field at Dayton, Ohio. In 1926 he held thirteen world aircraft records at one time.

BUT, of course, civilian ATC pilots aren't the only airmen flying the oceans these days. AAF officers and men are ferrying planes daily to the combat theatres all over the world. One of the most vital of these ferry routes is that across the South Atlantic, and one of the most important phases of the trip is the briefing pilots and their crews get at Morrison Field, the "Grand Central" of this southern run. A description of briefing at Morrison has been written for AIR FORCE by Captain T. W. Finnie, Group S-2 officer at the field. His article appears on Page 28.

WILD AND WOOLLY tales of terror in the jungle with its ferocious beasts, deadly snakes and man-eating plant life are considerably debunked by the Arctic, Desert and Tropic Information Center this month in the article, "Exploding the Jungle Myth," on Page 22. The ADTIC experts advise men who are headed for the jungle country to visit their local zoo before departing and take a good look at what probably will be the only animals and other jungle critters they will see before they return home.

FURTHER standardization of the AAF flying training program and greater uniformity in cadet instruction is anticipated in the establishment of the Central Instructors' School at Randolph Field. The work of this new school is described in the article, "Taking the Kinks Out of Training," appearing on Page 34. The author is Colonel Edward H. Underhill, director of training at the school.

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CROSS COUNTRY

Changes in the gunnery program, and other developments of the month within the Army Air Forces.

AERIAL gunnery occupies a top spot on the Air Forces "check list." Combat experience has definitely linked shooting ability to the success of missions, and has resulted in some significant changes in our gunnery program.

One interesting change eliminates the "career gunner"—the man who knows only gunnery and goes straight to combat without first acquiring a technical skill.

This doesn't affect the status of the "career boys" who have already learned their gunnery, many of whom are now shooting it out with the enemy, but hereafter gunnery training will always follow technical training. Until recently you could take gunnery training before or after the technical.

It has been found that a gunner, like a ball player, must have continual practice to maintain his shooting eye. This shift in the training schedule will enable trainees to start gunnery after other training has been completed and then continue to practice through OTU and on into the combat area.

Back in December gunnery was made mandatory for radio-operator mechanics, airplane mechanics and airplane armorers. Other changes now taking place are designed to increase the practicability of training. Instead of the five or six weeks' course, for instance, a seven weeks' course is being instituted. It will include four solid weeks of firing from ground and air at all conceivable types of targets.

In addition, schools are practically abandoning written examinations in favor of actual demonstrations of ability, the reason being that men with academic proficiency were not always found to have an equivalent manual dexterity. Increasing stress is being placed on manual ability, although thorough knowledge of an academic type is still necessary. The manner in which you flip your hands around is rather important when

you're being tested on your ability to correct malfunctions at 25,000 feet with mittens on.

Here are a few of the more important accomplishments demanded of students of the Flying Training Command's flexible gunnery schools before graduation and assignment to OTU and RTU:

Detail strip the gun, blindfolded, without special tools, and, after the instructor has mixed up the parts, accomplish the following while reassembling the gun: pick out the part, name it and describe what is broken on two or three broken parts, intentionally placed with other parts by the instructor.

While blindfolded: enter and leave the turret correctly, quickly and with minimum physical exertion; locate all switches, turn them on in proper sequence and start the turret without delay.

Show ability to estimate range at 300, 600 and 1,000 yards for all enemy aircraft taught in Aircraft Recognition.

WASHOUT

One of our favorite little stories concerns a lieutenant in a heavy bombardment group in North Africa who took a truckload of enlisted men into town for a dip in the public bath. Being a bit vague about its location, the lieutenant stopped a native and asked for directions. But the Frenchman knew no English and the American knew no French. So the lieutenant did a pantomime, going through all the motions of removing his clothes and taking a bath. The Frenchman watched the act closely, glanced at the eager faces of the men, then smiled broadly in perfect understanding. The ad-

dress he gave was near by. Upon arrival the lieutenant lined up his men outside, each with towel in hand, and went in to make the necessary arrangements. It didn't take him long to discover that the establishment was a *maison de joie*. We understand an orderly retreat was accomplished, and the original objective attained. (For this one we are indebted to Lieut. D. R. McGoldrick, APO 520, New York City.)

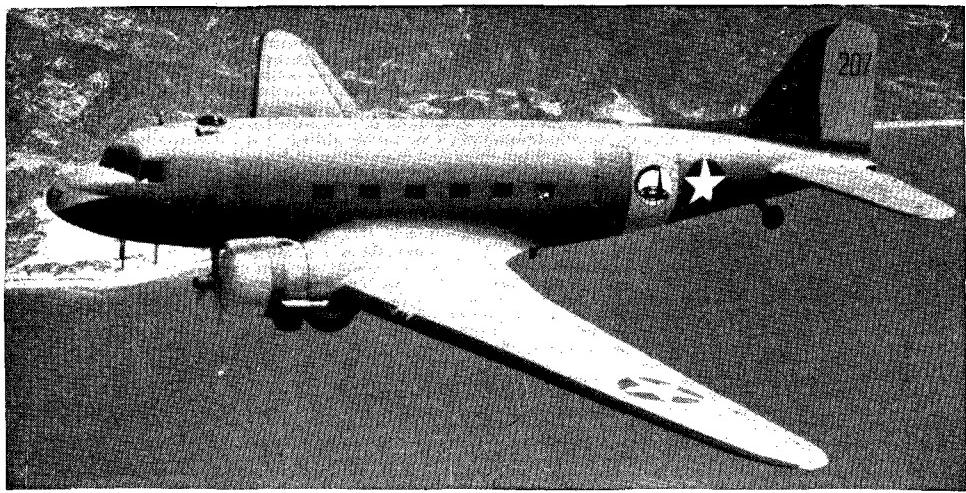
THE ENEMY WILL REGRET

We have just received a report on Staff Sergeant Shorty Gordon, hero of the article "Angels Don't Shoot Guns" in the June issue of AIR FORCE. As you may remember, a postscript to that article stated that Shorty was missing from a raid on Germany and believed to have bailed out over enemy territory.

It has now been definitely established that Shorty is a German prisoner of war.



Peashooter



Nose, engine cowling, fuselage and rudder of planes used by Domestic Transportation Division, ATC, now have identifying bands of yellow.

NEW TRANSPORT COMMAND MARKINGS

Certain yellow plane markings have been adopted by the Domestic Transportation Division of the Air Transport Command to make their planes engaged in training and cargo operations more easily recognizable from the air and ground. (See cut above.)

All planes of the Command used in transition transport training, as well as those ships in the United States and on domestic routes from Brownsville to Panama engaged in cargo operations, will have their vertical tail rudder painted yellow with eighteen-inch-high black figures giving the ship number. Girdling the fuselage just behind the cargo or loading door will be a 42-inch yellow band, with the circular insignia of the Air Transport Command painted in the center of the stripe on both sides of the plane. Between this yellow stripe and the tail assembly will be the white and blue circular star insignia of the AAF.

The engine cowling on all ATC planes in this category will be painted yellow and each ship will have a yellow diamond on the nose, approximately twenty by forty inches in size with four-inch-high black figures. In the case of twin-tailed types both tail rudders will be painted yellow. For general information, the various types of training planes common to Air Transport Command operations are the C-53, C-49, C-48, B-25 and AT-17.

These markings, the Air Transport Command points out, are not to be confused with the yellow identification markers in use by the Troop Carrier Command. The outstanding differences are that on Troop Carrier Command planes the stripe girdling their planes is farther back on the fuselage and the wing tips are painted yellow.

THE WINNAH

The somewhat popular opinion that wartime expansion of flying had led to a relatively large number of training accidents within the Army Air Forces got a solid kick in the teeth last month when the Air Forces received the safety award of the National Safety Council.

The Safety Council, 32 years old and con-

sidered the top authority on such matters, had made eleven previous awards but this was the first time a military organization copped the honors. All the others had gone to industrial firms.

The award is based on maximum production with minimum loss of manpower. In this case, it meant the maximum production of pilots with the minimum loss of life. The clincher was the fact that 95 percent of Army Air Forces trainees complete the training phase of the program without an injury.

THE EYES OF TEXAS

It requires no provocation at all for a Texan to leap to his feet, clear his throat, and burst forth into what he considers the national anthem, "The Eyes of Texas Are Upon You." This is a little tale about two such eyes, and rather sharp eyes at that. Our hero is Staff Sergeant Raymond C.

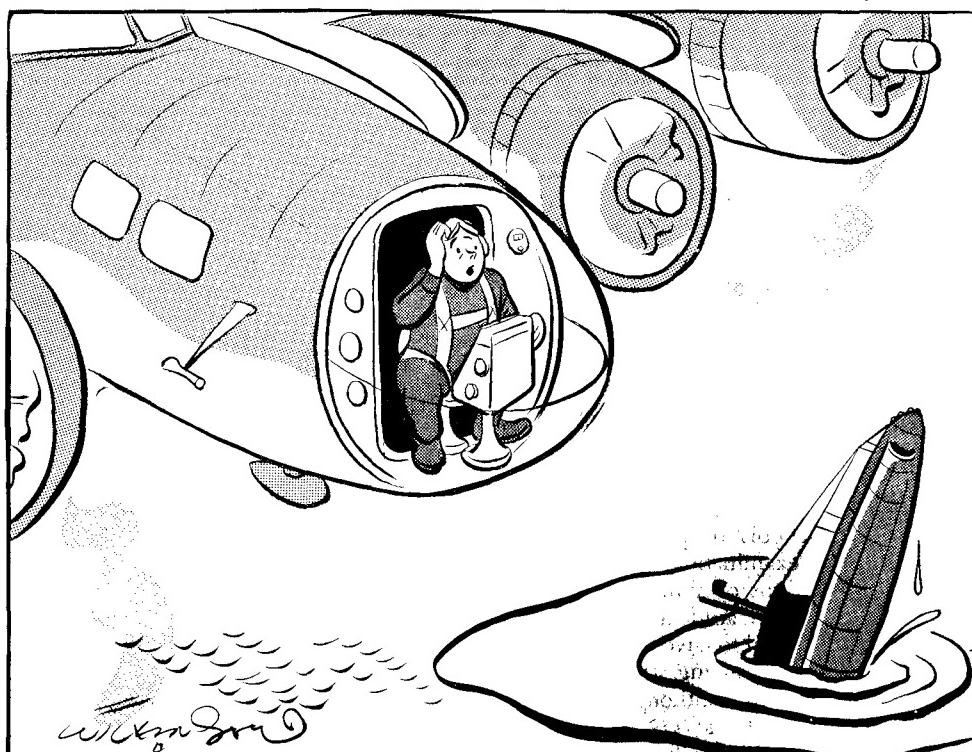
Matthews, Jr., of the 404th Base Headquarters and Air Base Squadron, at Texas' Fort Worth Army Air Field.

The story begins with a jangling telephone in the office of Captain R. E. Dysart, former Fort Worth Chief of Police, now Civilian Chairman of the Office of Civilian Defense in that city. The caller identified himself as Sergeant Matthews, home on a three-day pass from Tarrant Field (at that time the name of the Fort Worth Army Air Field), and said he had spotted an Italian Savoia-Marchetti 81 bomber over the city at about 1,000 feet.

Dysart then checked with the post intelligence officer at Tarrant Field and Matthews was identified by that office from personnel records and reached by telephone at his home. He substantiated the report to Intelligence that he had given to Civilian Defense, describing precisely the recognition features of the plane—three engines, low wing monoplane, tapered leading and trailing edges, rounded wing tips and peculiar bracing of the tail. Matthews said he had worked in the aircraft recognition section of the ground school at the station and, despite the improbability involved, was positive of his identification of the foreign aircraft. In fact, he became downright insistent.

Well, as you might have guessed by now, Matthews really knew his stuff. It was definitely established, through higher Civilian Defense Control sources, that a Savoia-Marchetti 81 had actually been over Fort Worth. A checkup revealed that the ship had taken off from Brownsville, Texas, for Meacham Field, Fort Worth, developed landing wheel trouble and could not land at Fort Worth but later made a successful landing at Dallas.

Just what mission the Italian plane was



"Now to think of something clever — like 'Saw my bank same!'"

—FRITZ WILKINSON

performing was not announced, but it's no secret that captured enemy aircraft are being brought in from the combat areas for purposes of study.

Anyway, we have added Sergeant Matthews to our personal heroes file and hope there are more like him.

SKIRTS

We're not so sure about this one, but anyway it's Technical Sergeant Joseph F. Marling's story, not ours. By way of introduction, he served as engineer on the B-17 "Yankee Doodle" and has more than fifty combat missions to his credit in the Asiatic Theatre. On a certain overwater mission, reports Sergeant Marling, they flew low over friendly natives in canoes. The girls in the canoes wore only grass skirts, and there was such enthusiastic handwaving both from the air and water that a return run was made. Enthusiasm mounted on all sides, but the girls stole the show by removing their skirts and waving them high in the air at the boys. How low can you fly a B-17, anyway?

"How Our Army Grew Wings"

Our Army grew its wings the hard way. A detailed account of the struggles, disappointments, tragedies and triumphs of that small band of enthusiasts who were willing to risk their necks for the future of military air power is contained in a new book, "How Our Army Grew Wings." The authors are Charles de Forest Chandler, late Colonel, U. S. A., and Frank Purdy Lahm, Brigadier General, U. S. A., retired.

The authors are well qualified to write of airmen and aircraft before 1914, which is the period of military aviation covered in the book. Colonel Chandler was the first Chief of the Aeronautics Division of the Signal Corps. General Lahm was the Army's first airship pilot, and Major General in command of the Gulf Coast Training Center at the time of his retirement in 1941. Both were members of the board which tested and accepted the Army's first airplane.

The book (\$3.75) is published by the Ronald Press Company, New York City.

FOR PILOTS OF WORLD WAR I

We've been asked to tell old-timers that membership rolls are now open in the Order of Daedalians, an organization composed exclusively of commissioned World War I Army heavier-than-air pilots. Anyone who held the "R.M.A." or "J.M.A." rating with its silver wings prior to the armistice on November 11, 1918, is eligible for membership. Pilots who remained on active duty pioneered the fraternity under the leadership of the late Brigadier General Harold L. George, who assembled the original charter members constituting Flight No. 1 at Maxwell Field in March of 1934. However, the movement is now open to all who have the above qualifications. Anyone interested can obtain additional information by writing its Wing Headquarters, Room 4C 870, Pentagon Building, Washington, D. C. - THE EDITOR.



TIPS FROM THE ARCTIC, DESERT AND TROPIC INFORMATION CENTER

DESERT NOTE. It happened on a sand-waste of Cyrenaica. Under a rare, cloudy sky, a Tommy struck up a conversation with an old Bedouin and his middle-aged son. "Looks like rain," he observed. The old man smiled skeptically: "I think not, but I hope so, for my son's sake. I have seen it rain . . ."

PACIFIC 'CHASER.' Some of our fighting men in New Guinea have discovered that a certain species of crab carries under his shell a small pouch filled with pure, distilled water. The exact species of the crab isn't known to us at the present time, but an appropriate name might be the "Oasis Crab."

HOT STRATEGY. Americans stationed in Iraq, the great "land bridge" between Europe and India, have discovered that strategy applies to more than warfare in Moslem countries. For example, they've found out that when they are offered a third cup of coffee by their host, it's not a gross display of wealth or sheer disregard of the rationing system, but a polite Moslem way of pointing out that the visit has definitely come to an end.

ARCTIC BOMBERS. In the summer, mosquitoes are thicker above the Arctic circle than anywhere south of it, the tropics included—thicker and hungrier. Even in warm weather fighting men have to dress completely for protection against the assault of this impressive and harassing air force. Men go about completely clothed, down to gloves and headnets, and that means sweating under the 24-hour summer sun. But it's either sweat or be 'et!

JUNGLE JITTERS. Landing in jungle rivers has given many a pilot a pain in the neck. When looking from one bank of a river to the other, a mirror-image of the foliage and sky may be so perfect that the waterline can't be discovered. This phenomenon of dead calm is common. It's tough to judge your altitude when landing; you don't know whether you're fifty feet or fifty inches above the water surface. Ripples caused by boats break the mirror-like image and may help the pilot gauge the surface. Pilots can also buzz down and let the prop-wash create a ripple.

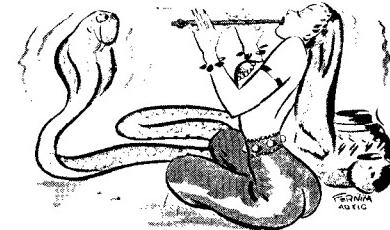
COLOR SCHEME. In many parts of the Arctic—such as treeless regions, sea areas or inland ice—distinctive landmarks are few. Man-made landmarks are therefore often of special importance; one color in particular has been selected as the most effective for recognition purposes. It is called "Flame Scarlet" and it was developed by the Bureau of Standards for the first Byrd Antarctic expedition. To the

average eye, it looks like a bright orange color. It shows up better on snow and green surfaces than any other shade. Signalling devices, markers, etc., used in Arctic regions should be "flame scarlet" in color. Bright orange crepe paper, the kind you can get at any five-and-dime store, makes a good temporary signal when stretched out; it packs away tightly, is light and easy to tote along.

DRINKING HABIT. Coral absorbs water like a sponge. The deeper layers are saturated with salt sea-water, but the upper surfaces are fresh with absorbed rainwater. Sip from the surface, say South Seas natives.

STAR GAZING. Here's the ABC of desert navigation as practiced by the Arabs: When travelling at night, they take their directions from the pole star, selecting another star in the direction in which they desire to travel. At intervals, they pick another star in the same general direction, since all stars move westward. Sometimes a guide will doze while walking and follow one star too long. It's a sure way of getting lost.

SNAKE-LORE. The movements of "trained" cobras, supposedly in response to the strains of seductive music, are not the result of the music at all, but of the Li'l Egypt movements of the snake-charmer. The cobra can't hear airborne sounds, but it watches and moves with the motions of the charmer.



SKY MAPS. With experience, a pilot can tell from the color reflection on an overcast Arctic sky the general type of country lying ahead and beneath him. Dark patches on the overcast indicate open water, bare or snow-free ground. Often, on ocean flights, islands will reveal themselves in reflections on the overcast.

GAS DOPE. In desert operations, extreme care is taken with high octane fuel at temperatures of 110 degrees or more in the shade. To avoid sparks, gas drums often are opened with bronze or other non-sparking tools. Also, the plane is grounded, as are the refueling funnel and nozzle.

The Arctic, Desert and Tropic Information Center welcomes contributions from all Army personnel with knowledge of the non-temperate theatres of operation. Submit to: Arctic, Desert and Tropic Information Center, Eglin Field, Fla.

AIR-GROUND COOPERATION IN NORTH AFRICA

By Brig. General Laurence S. Kuter

**AMERICAN DEPUTY COMMANDER, NORTHWEST AFRICAN TACTICAL AIR FORCE
NORTH AFRICAN CAMPAIGN**

WHEN the campaign in North Africa came to a close, with thousands of Germans and Italians voluntarily streaming through the dust toward our prisoner cages, the Allies had won a victory marked by the highest type of coordination in manpower and weapons.

There had been complete unison among British, American and French fighting elements.

There had been concerted action by all air, ground and sea forces.

There had been, particularly, an effective teaming of air and ground strength right in the battle area—with air power providing infantry and armored divisions with a measure of aid and support probably never before attained.

To officers and men of the Army Air Forces, this air-ground cooperation was among the most significant developments of the war to date. It was achieved by the introduction of a new type of air combat unit—the tactical air force.

Established during the campaign itself, this organization allowed for the employment of air power in a concentrated mass, striking at such time and at such points and with such speed as to be most valuable in the over-all operation. It prevented the misuse of air power, the scattered, inefficient employment of planes and personnel so likely to occur under old conceptions of air support.

It is intended that the lessons learned and the successful methods developed in air-ground cooperation shall be translated into the broad American air effort as quickly as possible.

During the Tunisian Campaign, Air

Marshal Tedder, under General Eisenhower, commanded the Air Forces in the Middle East, in Malta and in Northwest Africa.

Lieutenant General Spaatz commanded all of the Northwest African Air Forces, the fighting elements of which were the Strategical Air Force under Major General Doolittle, the Coastal Air Force under Air Vice Marshal Lloyd, a Photographic Wing under Colonel Roosevelt and the Northwest African Tactical Air Force under Air Marshal Coningham.

This discussion concerns the *air-ground cooperation* between the top air unit in the battle area, the Tactical Air Force, and the top ground unit in the battle area, the 18th Army Group. Because this discussion concerns *only* the Northwest African Tactical Air Force in the battle area, it should not be inferred that the magnificent work of the Northwest African Strategical Air Force on the ships, ports, docks and distant air bases on which the Axis forces in Tunisia depended was not appreciated by our battle area air and ground forces.

MOST certainly, our victory was directly influenced by the Strategical Air Forces' shattering blows on more distant links in the Axis armor and on the Northwest African Coastal Air Forces' effective protection of our ports and coasts and, naturally, on extraordinary efforts by Major General Dunton's Air Service Command and Colonel Ray Dunn's Troop Carriers. Our battle area air force is only one of several air forces which can claim a portion of General Eisenhower's Allied Force victory.

The Tactical Air Force is a completely new idea in the organization of an air force

fighting in the field alongside of an army. The idea was not evolved from book study or by theorists. Its conception, together with the details of its organization, grew gradually and as a direct result of long and bitter battles stemming back to the air-ground efforts of the British crossing the Western Desert. During the years of that fighting, a series of failures illustrated errors in air-ground cooperation and a series of successes indicated effective methods. In the Tactical Air Force we combined the desirable features learned in the Western Desert, and we believe we have eliminated the errors that had previously been made.

The concept of air-ground organization in the Tactical Air Force and in the 18th Army Group can be traced back to June, 1940, when the RAF could oppose a large, powerful and more modern Italian Air Force in Libya with only a handful of obsolete aircraft. This tiny RAF force not only held its own but eventually swept to complete victory when General Wavell, now a Field Marshal, advanced for the first time across Cyrenaica.

In that operation the Italian Air Force in Libya operated under the direct command of the Italian Ground Forces. The Italian Air Force consequently was used in penny packets at the order of local army commanders to give protection to their own local sectors. In contrast, the RAF, employed as a true air force and in concentrated mass, completely destroyed some 1100 Italian aircraft.

By the campaign of 1941-1942, the British had a large and efficient air force in the desert, this time opposed by the Luftwaffe. Several factors, principally the drain on

the British ground forces resulting from their requirements to move large units to the Far East, resulted in the long and now famous retreat to Alamein. Even though Rommel was continually pressing the ground forces back at this time, the air was largely controlled by the RAF in the Western Desert. The RAF was responsible to a great degree for the fact that Rommel did not annihilate the British Army at this time and was finally halted at Alamein.

During the lull that followed at Alamein, Air Vice Marshal Coningham, then commanding the RAF units in the Western Desert, put the final touch to his training and tactics and rebuilt his numerical and qualitative strength. The air force which was launched against Rommel in connection with the success of the 8th Army at Alamein and which pursued the defeated enemies across the desert to Tunis was in effect the first full flowering of a tactical air force, although at that time it didn't hold that name.

On February 18, when the Northwest African Air Force was formed, Air Marshal Coningham, promoted and knighted after Alamein, was placed in command of all air forces fighting in the battle area alongside the armies. Our Tactical Air Force, therefore, composed of both British and American units of fighters and bombers, was the first expression in actual practice of the years of experience gained by the RAF in the only theatre in which allied air units have fought the enemy alongside the ground units in the field. It was the quintessence of battle experience, the result of many mistakes, many trials and at last resounding success.

It was something far superior, as proved by results, in organization to anything which the Germans had ever evolved. It is an example on a big scale of the encouraging fact that the Allied commanders are clearly able to utilize the experience gained by hard fighting in this way. It is the pattern of the future, the way in which air power in collaboration with armies in the field will beat the enemy and win the war.

Doubtless, in the course of time and future experience, changes will be made, but the basic conception of a Tactical Air Force as the air power in the actual battle area will probably remain until the end of the war as tried and proved.

The function of the tactical air force is one of working in partnership with other components of air power, with the strategical bombing force which uses the longest range bombers on relatively long-term targets, such as munitions establishments, supply ports, and the like. The tactical air force works with the coastal air force which is intent on cutting the enemy's supply route by sea and in protecting our own. The tactical air force is concerned with the battle itself immediately in the battlefield.

It is easy to say that such an air force gives air support to the army, but the word "support" has now so many old-fashioned and wrong implications in the public mind

How the Tactical Air Force functioned in the North African campaign, and its potential influence on future operations

that it is much better not to use it. The word "support" always makes people think of air power used as an ancillary weapon of the army or navy; in operations which are primarily land or sea. It brings to mind a picture of bombing to extend the range of artillery, and particularly of squadrons of fighters at the immediate imperative call from ground commanders of relatively small sectors to attack enemy troops immediately in front of them or to defend their own troops from enemy bombers.

The local ground commanders obviously cannot have any knowledge of what is happening over the wide area of the land battle and of the air battle. So this conception obscures the inevitable two phases of the modern battle—the air phase and the combined air-ground phase. The narrow conception of air support is firmly imbedded in the public mind and particularly in the mind of the inexperienced soldier who is having his first taste of enemy bombing or strafing. That method is precisely the method by which the Italians threw away their air force with no gain in Libya. Although it is the method by which the Germans advanced through France, when air opposition was very scant, it is surely the method which was found to be totally obsolete and leading more toward defeat than victory in operations against a well-trained army and a well-trained air force in Africa.

It is much better to speak of *collaboration* between the army and the tactical air force. The army strikes from the ground, the tac-

Stuck in the mud! This is a problem whose solution requires plenty of elbow grease.



tical air force strikes from the air. The method by which this coordinated air-ground effort is applied is best illustrated by the workings in the combined air-ground headquarters in the battle area in Tunisia.

In a tent camp in the Tunisian mountains, the air and ground commanders lived and worked side by side. One was General Alexander, controlling and coordinating the 18th Army Group which consisted of the 8th Army, the 1st Army, 2nd U. S. Corps and the 19th French Corps. The other commander was Air Marshal Coningham, controlling and coordinating the Tactical Air Force which consisted of the Western Desert Air Force in the South and two fighter forces in the West which were backed up by a tactical bomber force. General Alexander controlled the land forces in the battle area. Air Marshal Coningham controlled the air forces in the battle area.

THE two commanders lived together in intimate daily consultation. They made their plans together, each stating what his force could contribute toward the general victory. They worked in complete harmony. They both knew that only the long reach of air power could achieve the quickest triumph in Tunisia, which was a destruction of the enemy rather than pushing him out of Africa. So General Alexander on his part moved his ground units steadily forward to capture and protect the air fields needed to tie down and then drive forward to capture the enemy.

Air Marshal Coningham's effort was in two distinct phases. First, the requirement that he reduce the enemy air to practical impotence, and after that to throw the full weight of his air force against the enemy army. The importance of those two commanders of land and air forces living side by side in the same camp, eating in the same mess and planning and operating daily on equal terms in close collaboration, cannot be overstressed.

The successful stages of the Tunisian battles follow much the same pattern. First came the 8th Army push through the Mareth positions. The Mareth battle actu-

Loading bombs on a P-40 of a Fighter Group in North Africa. Note daisies in the field.

ally began with an air blitz on enemy airdromes. Prior to the attack of the 8th Army, Air Marshal Coningham concentrated his entire air force on the enemy airdromes. After the strength of the German air force had been materially reduced by this blitz, he kept the northern and central air units operating exclusively against the German Air Force which relieved the Western Desert Air Force and the 8th Army of any concern over German opposition in the air. This left the Western Desert Air Force free by day and by night to employ hundreds of bombers and many squadrons of fighter bombers to search out individual enemy concentrations and divisions and operate with great effectiveness in the immediate front of the ground units of the 8th Army.

At the crisis of the battle in front of El Hamma, the Hurricane tank-busters were thrown in. The enemy broke and retreated. In this particular operation, the 146th Panzer Grenadiers Division was caught moving on a road and rendered completely ineffective by air attack alone.

After a short pause the 8th Army attacked at Wadi Akarit. Again the air units in the north and center were concentrated on the German air establishment. Once more the Western Desert Air Force was free to work at a maximum intensity on the German forces in the Wadi Akarit position. Again the enemy retreated, this time more quickly than was expected, to a semi-circle position from Bizerte to Enfidaville.

At this point it was the turn of the Western Desert Air Force to draw away what was left of enemy air power while the Tactical Bomber Force lent their strength to the attack by the First Army and the Second U. S. Corps.

The battle for the capture of German forces in Tunisia began, not on April 22, on which date the ground forces pushed off, but on the night of April 18-19 when we employed ninety night bombers against German airdromes. We had guaranteed to reduce the German air force to relative impotency by dawn of the 22nd. Our operations for the next three days are already well-known in the American press. It was during these days, of course, that the JU-52s and many of the escorts were destroyed. Our total efforts destroyed 112 German airplanes those two days.

The spectacular destruction of the 20 ME-323 6-engine transports on April 22, which incidentally were carrying the equivalent of a German regiment into Tunisia, was the continuation of our plan to knock the Luftwaffe down and keep it down during the period of the ground movement forward. During this period there were terrific, spectacular and important air victories which, however, in the long run, were not so important as the steady weight of air attack that the Tactical Air Force was turning on the enemy troops in front of the 1st Army. On the 22nd and from then on we had free fighter squadrons sit-

ting over the German airdromes daring the German to get up. On the 22nd and 23rd he did try to get up and was knocked back down. During this period, he was kept down by a small proportion of our fighters. The great balance of our force at this time was steadily in front of the main effort of the 1st Army.

The weight of daily attack during this period increased each day and was heavier than any air force had ever delivered in battle in collaboration with an attacking army. Our air units were placing in front of the main effort of the 1st Army a heavier concentration than had been employed at Alamein. This air effort increased to a crescendo on May 6 on the final drive from Medjez el Bab to Tunis. On that day we delivered 2,146 individual airplane sorties, the great majority of which were bomber, fighter-bomber or strafing missions on a 6,000-yard front before the main effort of the 1st Army. This continual rain of bombs in front of the advancing divisions had the effect of blasting a channel from Medjez el Bab to Tunis. You know the result of that drive. General Alexander's view of the effectiveness of that effort is expressed in a single sentence of his on May 8 to the Tactical Air Force: "Without your support this drive would just not have been possible."

THE fact that each step in this battle was a carefully planned one and that the results of each step were exactly the results that we expected to accomplish, both in the air and on the ground, is most reassuring. There were no accidents. None of the results came from chance happenings. This battle is clearly the result of carefully detailed and coordinated air and ground planning and execution.

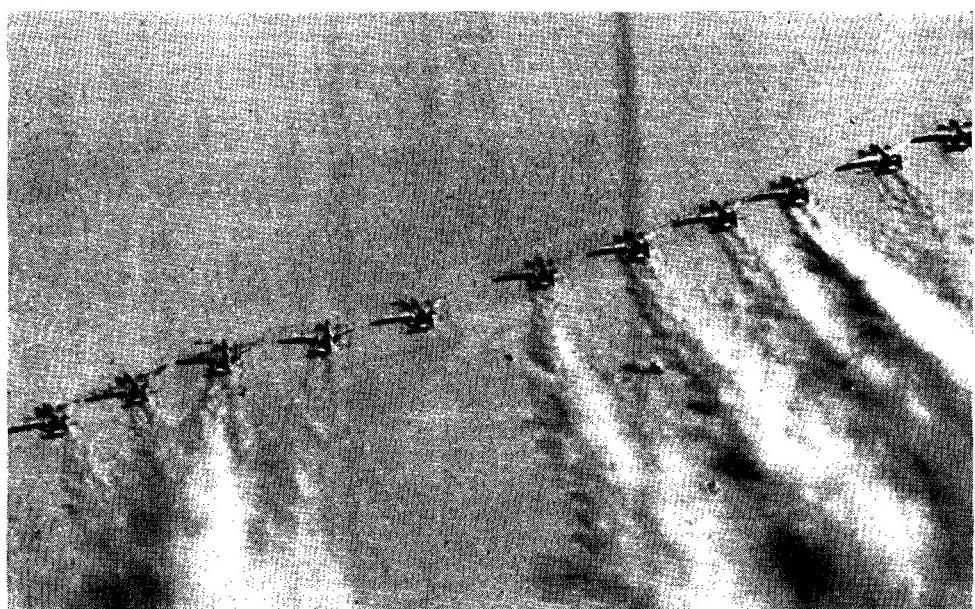
One result of this particular battle is believed to be of great significance for the future. That result is briefly stated in the fact that the first 25,000 German prisoners, whom we saw in our 2nd Corps Cage on

May 9, consisted of selected Nazis from two S S Divisions, the Manteuffel and Hermann Goering, and German soldiers of the highest state of training from one Panzer Division. If these men were not the cream of the German armed forces they were surely well above the average Nazi. They apparently had been ordered to fight to the last man, to eat the last biscuit and fire the last round for the glory of Hitler and the Fatherland. They did fight well and bitterly. However, when it became clear to them that they would lose that battle, they immediately surrendered without further ado. They surrendered great quantities of food. They had much ammunition still remaining. Although their units had disintegrated their individual morale was high.

As prisoners arrived for admission to the 2nd Corps Cage, many of them driving up in their own motor transport or moving in enormous columns where there was no effective guard at all, they were assembled in groups of one hundred by German officers, and marched off like guardsmen, singing German marching songs, into the cage. Surely if this picked bunch of Nazis hauled down the flag and surrendered after it had become clear to them that they had lost the battle, our course toward defeat of Germany is assured.

The effectiveness of our bombing was graphically illustrated in Ferryville, in Bizerte, in Tunis and particularly on the road from Bizerte to Tunis. Bizerte was a town and port full of establishments being used effectively by the Germans. We attacked Bizerte with the intention of blotting it off the map. On May 9 when General Alexander, Air Marshal Coningham, General Bradley and I drove through Bizerte, we drove around for over an hour and found not one single inhabitant of the city. We saw no single building, however small, which was unscathed. On the other hand, the town of Ferryville was one which we knew to (Continued on Page 33)

A flight of bombers sets up a flurry of sand during take-off.





FLIGHT TO NAPLES

By Lt. John H. Namle
U. S. ARMY AIR FORCES

FOR a long time we had been anxious to get a kick at the shin of the Italian boot. From our secret airfield in French North Africa our B-17 Group had bombed targets in Tunis, Sardinia and Sicily, but we had been looking forward to our first visit to Italy as a memorable landmark in the Mediterranean campaign.

Awakened at seven o'clock on a Sunday morning, we were told to eat breakfast quickly as there was an early briefing. For breakfast we had pancakes, fresh eggs, cereal and coffee. We then piled into trucks for the ride to the old granary which had been taken over as the Group's headquarters.

We knew that the planes had been loaded with fragmentation bombs so speculation ran high as to whether the target was an airdrome or a troop concentration.

The intelligence officer in charge of the briefing stepped on the platform and picked up the pointer. Somewhere in the room a news cameraman's photo bulb flashed.

"The target for today is the Capodichino Airdrome several miles Northeast of Naples . . ."

This was it—the target we had been waiting for. The briefing officer went on:

. . . flying over Capri . . . Mount Vesuvius . . ."

THERE was little sound in the room while the target information, the amount and position of anti-aircraft batteries, and the number of enemy fighters we would probably encounter were revealed. The navigators checked on routes. The weather man gave his report on the weather out, the weather to be expected over the target and on our return trip. We synchronized our watches. The briefing was over.

After we had drawn our maps, trucks drove us out to the dispersal area where our planes were warmed up and ready to take off. Since it was to be a long mission the mess hall had sent out a box of food for each crew and a candy bar for each man.

At 8:45 we took off, circling the field several times while other groups joined us, making a total of about a hundred planes. The sky seemed full of grey B-17s. Then the swarm of planes assembled in formation and headed toward the coast.



A flight of B-17s (above) returns after inflicting this damage on the Naples harbor.

Captain L. V. Casey was the pilot of "The Gremlin." I was co-pilot and we were to fly on the squadron commander's left wing.

The sky was clear although there was a slight ground haze. We passed over the north coast of Africa at about 4,500 feet. Directly below was a small fishing village clustered at the foot of a mountain. The Mediterranean was calm, clear, and the most remarkable blue I have ever seen. Near the coast, it was easy to distinguish the shallow water covering the reefs and bars.

Once clear of the land we tested our guns. The sharp rat-a-tat-tat of the practice shells sang out above the noise of the motors. Soon the steady drone of the engines became a part of the silence and we were unconscious of it. The bright sun was reflected on the metal of the planes.

The monotony of our crossing was broken by chatter on the interphone, Spam sandwiches, and Casey and I spelling each other at the wheel. Our course was directly

between Sicily and Sardinia. Although we were flying at only 1,000 feet the haze almost hid Sardinia and we couldn't see Sicily at all. Clouds far off in the distance marked the coast of Italy. At a signal from our group leader we started to climb.

We went on oxygen at 10,000 feet. At 20,000 we were well in sight of the coast. Below us was the Isle of Capri, a barren, rocky island with several small white villages perched on the shore. A thin spiral of smoke drifted up through the clouds. This was Vesuvius.

As we passed over the coast of Italy, we were at about 25,000 feet. In clear view below were small, neat Italian farms, then the city of Naples, the airdrome, and even the insane asylum we had been warned not to hit. Approaching the target, we stayed about 25,000 feet for a minute or two and then dived down a few hundred feet, turning towards the target and opening the bomb bay doors at the same time. We were on our bombing run.

The engines were purring smoothly. Casey was flying and I had nothing to do but look around and watch the excitement. Off to the left, I could see the other groups dropping their 500-pounders on the docks and railroad yards. Clouds of smoke rose from the explosions. The other groups were attracting quite a bit of inaccurate flak, hundreds of large black bursts.

Then I could see bomb clusters from the other two planes of our element start to drop. That meant that our bombs would be dropping too.

(Continued on Page 32)

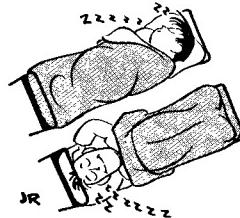


What's your AIR FORCE

I.Q.

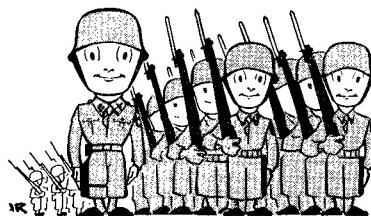


- 1. The Army Air Forces' new A-36 is the dive bomber version of the**
- a. P-51
 - b. P-40
 - c. P-47
 - d. P-38



- 2. Beds in barracks are staggered head to foot in order to**
- a. Keep snorers from annoying others
 - b. Prevent the spread of respiratory diseases
 - c. Keep the barracks neat and orderly
 - d. Uphold an old military custom

- 3. The expression "Full Rich" is associated with**
- a. Payday
 - b. Gasoline
 - c. Bombs
 - d. An inebriated heiress



- 4. All steps in marching executed from the halt begin with the left foot.**
- a. True
 - b. False

- 5. Which word is inappropriate in this grouping?**
- a. Benzene
 - b. Carbon tetrachloride
 - c. Calcium hypochlorite

- 6. When spoken to a warrant officer named Jones should be addressed as**
- a. Jones
 - b. Officer Jones
 - c. Mister Jones
 - d. Warrant Officer Jones

Here's a hot weather teaser to test your knowledge of a variety of Air Forces questions. Credit five points for each correctly answered, and if you score 100, yell for promotion. Ninety is excellent; 80 good; 70, fair, and 60 is below par. Answers are on Page 32.

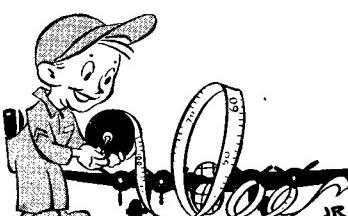
- 7. The total weight of an airplane is divided by its wing area to calculate**
- a. The cargo loading
 - b. The wing loading
 - c. The bomb load
 - d. The gas load
- 8. At which of the following commands are both silence and immobility required?**
- a. Fall out
 - b. Rest
 - c. At ease
 - d. Parade rest



- 9. It is wise to drink carbonated beverages prior to high altitude flights.**
- a. True
 - b. False
- 10. When presented, the Medal of Honor is usually**
- a. Pinned on the upper left coat pocket
 - b. Pinned on the upper right coat pocket
 - c. Hung on the recipient's neck, suspended on a ribbon
 - d. Pinned above the left coat pocket



- 11. How far below the top of the shoulder seam should the Air Forces shoulder sleeve insignia be worn**
- a. 1 inch
 - b. ½ inch
 - c. 1½ inch
 - d. On the seam

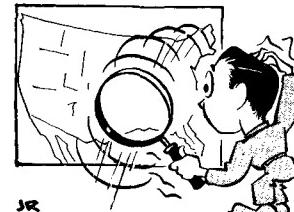


- 12. The wing span of a B-24 is**
- a. 85½ feet
 - b. 210 feet
 - c. 110 feet
 - d. 175 feet
- 13. Grease and oil must never be allowed to come in contact with oxygen equipment**
- a. True
 - b. False

- 14. A wind sock is**
- a. Worn by Arctic airmen
 - b. A tow target
 - c. A wind direction indicator
 - d. A pitot tube cover

- 15. A theodolite is used by**
- a. Pilots
 - b. Navigators
 - c. Meteorologists
 - d. Mechanics

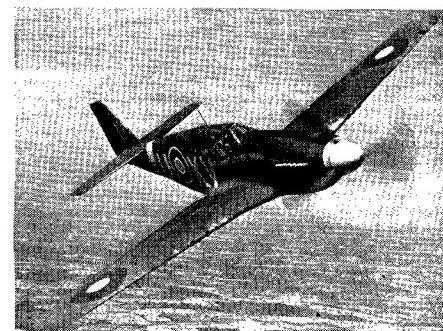
- 16. A Navy flying officer with two broad gold bands on his sleeve is equivalent to an Army Air Forces**
- a. First Lieutenant
 - b. Captain
 - c. Major
 - d. Lieutenant Colonel



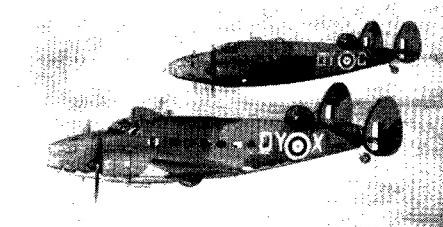
- 17. Morrison Field is located in**
- a. California
 - b. Florida
 - c. Texas
 - d. Arizona

- 18. A profile interrupter**
- a. Automatically switches from full rich to lean mixture at the proper time
 - b. Prevents a turret gunner from shooting into the tail, the propeller or the other surfaces of his own plane
 - c. Cuts off the oxygen supply on reaching the ground
 - d. Prevents a mechanic from putting too much air in the tires

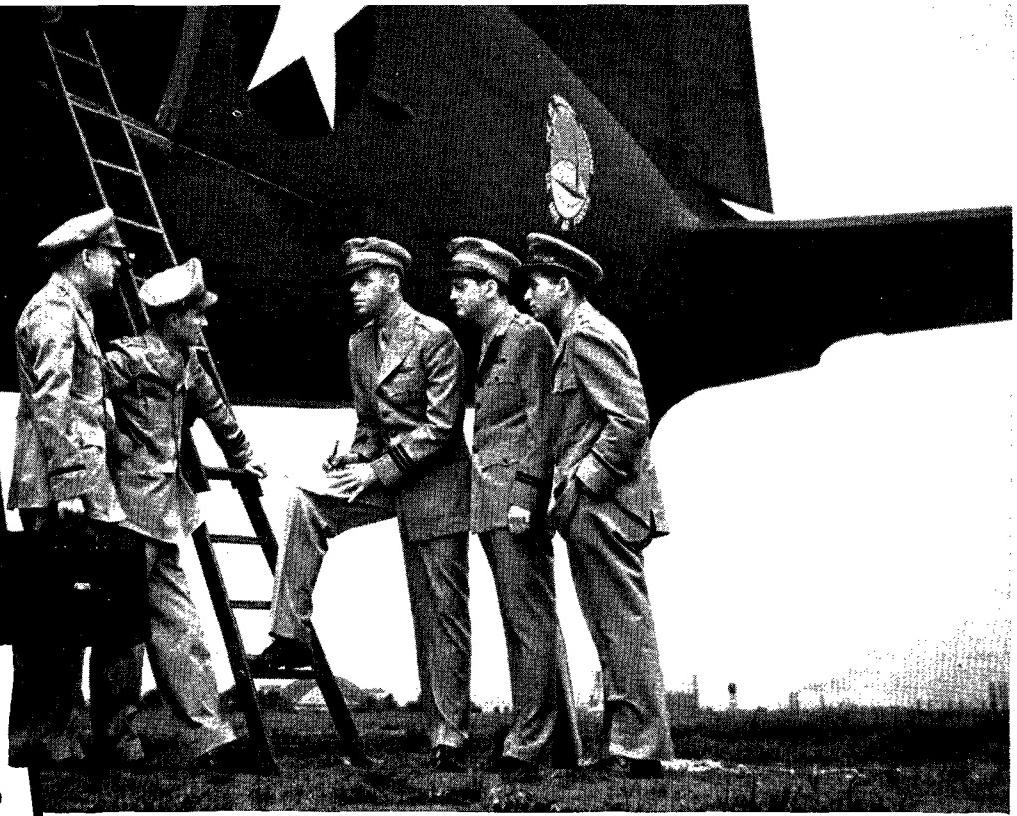
- 19. What is the British name for this airplane?**



- 20. What is the British name for this airplane?**



HE'S REALLY QUITE A MAN!



By Colonel Harold R. Harris

COMMANDING OFFICER, DOMESTIC TRANSPORTATION DIVISION, ATC

The Air Carrier Contract pilot wears a different uniform, but it pays to respect him for the vital job he's doing.

just imagine how these pilots feel when the Air Transport Command has orders for a delivery of high priority material to some lonely mountain airport halfway around the world.

As one chief pilot expressed it the other day at New York's teeming La Guardia Field:

"A year and a half ago our company made its first flight from New York to Mexico City. For a month before the scheduled departure everybody in the company from the president on down was in feverish conference to iron out the details. Recently I got orders to survey a route to India for the Army. A couple of days later I went out, cranked up and took off. There weren't more than a handful of people who knew anything about it. They were all too busy sending planes to other remote spots to care about a new route that in ordinary times would have been enough to give everyone the jitters for a month of Sundays."

The next time you meet one of these pilots take a good look at him. He was probably flying the mail or barnstorming passengers off golf courses when you were reading Boy's Life and wondering if you could talk the old man out of fifty cents to buy some balsa wood for that new model airplane you were building.

Like most of them, he probably has a

minimum of 2,500 hours of flying time, with the average being in the vicinity of 4,000 or 5,000 hours. Stack that up against the average of 300 or 400 hours for the Army Air Forces pilot.

Chances are he is a reserve officer and that he graduated from Kelly and Randolph back in the twenties or early thirties, when they really braced you, mister. Nine out of ten have applied for active duty and been told by Uncle Sam to stay put. They are more valuable where they are, flying vitally needed supplies and personnel to combat areas and training new aircrews here at home.

As an ATC man he has his own status in the organizational picture of the Army Air Forces. All air carrier contract personnel are directly responsible to the Commanding General, Air Transport Command. When they are in the field they are subject to military law and in the event of capture by enemy forces air carrier contract personnel are entitled to be treated as prisoners of war. To assure this status they are being provided with official War Department Certificates of Identification.

Pilots, navigators, division managers, station managers, assistant station managers and all personnel of equivalent responsibility will be accorded the same privileges as commissioned officers with regard to accommodations, transportation and messing, both within and outside the United States.

Listen to some of the stories these men can tell as they sit around of an evening.

Like the old timer who returned recently from way above the Arctic circle. He had to make a forced landing on a frozen lake in the wilds of (Continued on Page 24)

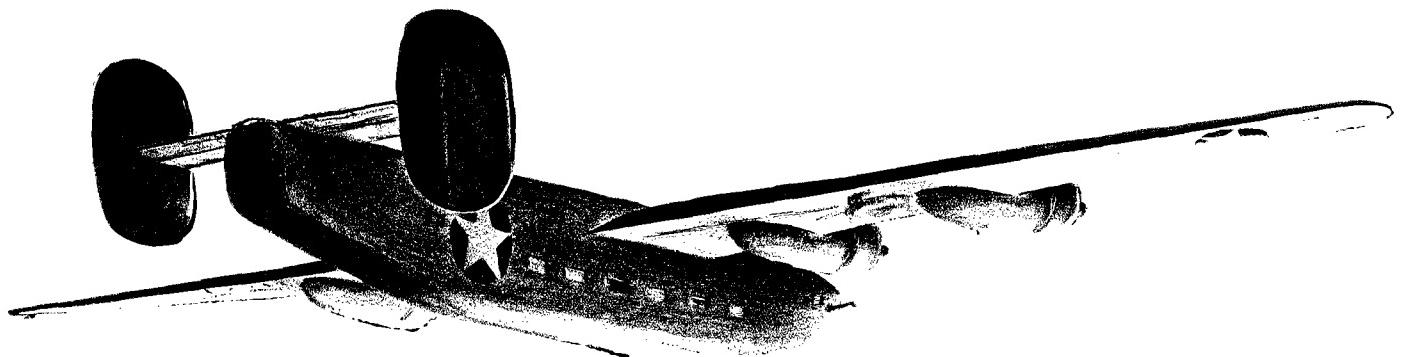
THE next time an airplane comes taxiing up to the ramp at your station and the pilot steps out wearing a uniform with stripes on the sleeves or bars on the shoulder straps of his shirt and with a cap insignia bearing the letters "ATC" don't ask him as a soldier did recently at one of our South Atlantic bases, if he is an officer in the Australian Tank Corps.

You'll be seeing this uniform a lot from now on all over the world. It is approved by the War Department for the civilian crew members employed by the commercial airlines under contract to the War Department. Together with Army crews, these men are flying cargo, mail and passengers and are training aircrews for the Army Air Forces Air Transport Command. To be technical, AAF Regulation 40-4 calls them "Air Carrier Contract Personnel."

Step up and get acquainted with one of them. You'll find he is quite a flyer, usually as good a story teller and a nice guy with it all. And although retaining his civilian status, he has earned the right to wear that uniform, just as much as any man in the Army Air Forces.

Because today the Air Transport Command is flying to places that yesterday were only names on a map—in India, the Arctic and China, over North Atlantic, South Atlantic and South Pacific, to give you a general idea. And these pilots of the Command have a personal acquaintanceship with the monsoon in the Far East, the sandstorms of the Sahara and the milky fog of the Arctic.

Remember the first time they turned you loose on cross country down there at Randolph or Ellington or Maxwell? Okay then,



Our Pacific Sky-Lane

Capt. Creekmore

By Major Charles E. Shelton

7TH AIR FORCE

ONE blacked-out Hawaiian midnight in January of 1942, three B-17s were wheeled out of bomb-scarred hangars at Hickam Field and rolled to the edge of the mat. Flight crews, guided by dimmed flashlights, approached the ships. The feeble rays of their lights played on engine nacelles, ran up and down landing struts and across all movable parts of the huge planes.

No item of inspection was slighted. It was a thorough, last-minute check, for the planes were about to take-off on a trip that would require top-flight performance. Theirs was to be the inaugural flight of a new trans-Pacific war-time ferry route for the Army Air Forces.

One by one the Fortresses taxied to the end of the mile and a quarter strip. For a minute or two they sat there, the roar of their engines rising and falling as the pilots—Captains Hobson, Hewes, and MacPherson—warmed up the motors and checked their instrument panel. Then they turned into the wind. The first plane started its run, gathering speed. In a score of seconds the control tower clicked past the wing tip. As it reached the last hangar the Fortress lifted and moments later passed low over the ghost town of housing units that cluster alongside the Kamehameha Highway leading to nearby Pearl Harbor. Planes number two and three followed in quick succession.

They were on their way to the battlefield in Java, hopping southwestward via a string of Pacific islands and atolls most of which had never before seen a land plane. Only

Kingsford-Smith, fourteen years earlier, had ever made a similar trip. Actually, the two flight lines would differ by hundreds of miles of latitude most of the way.

Only a few Army men saw the Fortresses take off. A handful of officers—the late Major General Clarence L. Tinker, Commanding General of the Hawaiian Air Force; Colonels Albert K. B. Lyman, B. L. Robinson and Bob Fleming of the Corps of Engineers, and Colonel Gordon Blake of the Air Forces watched as the blue exhaust flames of the B-17s moved out over the cane fields, turned across a darkened, sleeping Honolulu, then out to sea across Diamond Head. After the sound of the motors died away into the night one of the men said, "Well, there go the first planes on the long road to Tokyo." Someone mentioned that "The Road to Tokyo" would be a good name for the war-baby.

General Tinker had his own thought on the subject, and since the name he offered was a good one and since he was a General, his suggestion stuck. "I believe we ought to call it The Southern Cross Airways," he said.

AND, thus, without fanfare, was born the aerial sky-lane that today rivals the North Atlantic Newfoundland-British Isles run and the South Atlantic Natal-Africa routes in strategic importance. The Pacific line has been opened more than a year, yet most of its operating details are strict military secrets. Most of the bases the planes use have never

been mentioned in public print in connection with the route; many of the alternate fields—some of them nothing more than clearings in a coconut grove, others dredged coral strips—are names that would send even a veteran beachcomber to an atlas. Most of the bases, both primary and secondary, are far out on the Pacific combat frontier. Some of the airports have been bomber, some shot at from Jap subs.

At Fiji the biggest menace seems to be mosquitoes. At one of the New Caledonia fields the native deer were so numerous they became a hazard. There's no record of a plane hitting one of them while taxiing, but the deer used to graze right at the edge of the runway. Sometimes this proved too much of a temptation for some homesick nimrod who would unlimber his .30 caliber and blaze away. It was good sport, shooting deer from a side window of a B-17 or from a parked jeep, and it made good reading in the letters back home, but it unfortunately was dangerous to the welfare of the encampment, a few eucalyptus trees to the rear of the hunting grounds. One of the squadrons, as a result, had to establish game laws, prohibiting deer hunting in camp. "Anyone wanting to shoot deer will check in with the sergeant before going out," reads the order.

Some of the South Sea airfields, except for their cane-field and coconut settings, could be a ferry station somewhere in England. P-38s sit next to ancient tow-target Vincents. RNZAF Hudsons bunk next to C-47s, De Havilands and Beaufighters mix with B-26s, and even Gypsy Moths and L-5 Grasshoppers get together.

The South Pacific route was in the planning and construction stage long before we entered the war. Early in 1941, we had one "aerial life-line" open to the Far East. It

Born of the war, this Hawaii-Australia ferry route has grown into a transport line of major importance in maintaining the long Pacific battlefield.

was the above-the-Equator Hawaii-Midway-Wake-Guam run. This route had been successfully tested by a couple of flights of B-17s that were sent to the Philippines, but it admittedly was of dubious value in case we got in a scrap with the Japs. The run was highly vulnerable, cutting across Nipponese lines of communication and surrounded by Jap-mandated bases. It didn't have much of a chance. That's why Major Roger Ramey and Captain Brooke Allen of the Hawaiian Air Force were sent below the Equator and across the date line early in 1941 to find a better lane for land planes. They traveled by PBY, steamship and fishing boat and with Dutch and Australian airmen over much of the South Seas, gathering information, maps and photos for Colonel Lyman's construction crews.

Later, another party headed by Major Gordon Blake went out from Hawaii to survey mid-Pacific islands. After the Southern Cross Airways got under operation General Tinker put Gordon Blake, now a Colonel, in operational control as his troubleshooter, passenger agent, freight manager and communications chief. Today Colonel Blake probably knows more about Allied territory in the Pacific than any other man in uniform.

In constructing some of the bases, Colonel Lyman used British equipment and men to get the job done. The work was not scheduled for completion until mid-1942, but when the war broke out the task was rushed threefold. The pony-express air line gained operational status in record time. When the first planes went through, they refueled from 55-gallon drums and the crews slept on cots under the planes' wings. The islands were practically defenseless. The whole thing was run on a day-to-day, plane-to-plane basis in its first months. The constant threat of the advancing Japanese, the rudimentary nature of radio and technical aids for long cross-water hops, the bumpy runways, the temporary flow of supplies to the island dots, made constant personal supervision a necessity. No Army manual covered the problems that arose each time a plane took off. Yet surprisingly few planes were lost in those first days of war.

Since its rugged birth the ferry route has grown to a transport line of major importance in our successful maintenance of the long Pacific battlefield. Compared with those early trips from California to Australia, in the days when ferry pilots didn't know for sure whether the Japs would beat them to the next stop, the present traffic is doing an enormous job. Dozens of planes daily are winging over the Pacific. General Henry H. Arnold's plane holds the flight record, 35 hours and 10 minutes, from Brisbane to San Francisco. The best elapsed time during the Southern Cross Airways days

was made by Consair's Captain Ted Howe, who flew from Amberly Field to Hamilton Field in 42 hours and 31 minutes. Captain McMacon, another contract veteran, has made the round trip from the States to Australia and back in five and a half days.

Types of planes that have made the Australia run include B-17s, B-24s, C-47s, C-53s, B-25s and B-26s. P-38s have made it from Hawaii to Australia. The planes are flown not only by ferry pilots, veterans of the Atlantic route, but also by Army pilots, some of whom have never flown a body of water larger than San Francisco Bay.

In its year and a half of operations the Southern Cross Airways, now the Pacific Wing of the Air Transport Command, has carried thousands of military and government passengers. Hundreds of tons of priority war cargo have been sent "down under" to the Solomons and New Guinea



fronts via this route. Not all the space, however, has been given over to G. I. Early cargo records, for instance, list one kangaroo, transported to California from Australia by Captain Haigains. A General, needing some uniform material, had some wool yardage delivered to him via LB-30. One urgent request from a wind-blown stenographer at Hickam Field for a card of bobby pins (Honolulu's five-and-dime had sold out) was filled by Hamilton Field. Colonel (now Brigadier General) "Blondy" Saunders' cigars always received a high priority on the Solomons run. Dogs, rat poison and flit guns were on the early freight lists. A bathing suit for an Australian Colonel's wife was sent from San Francisco. Some coffee percolators made a rush trip to Australia shortly after the Americans moved in, ". . . because Aussie coffee just isn't

ILLUSTRATED BY
CAPTAIN RAYMOND CREEKMORE

made right." Then a second kangaroo was sent up to California to provide heart interest for the first kangaroo.

Travelers who have made the long trip recall many famous landmarks, including Hawaii's Diamond Head (which, incidentally, doesn't look like much from the air). Fiji's "Handle-bars" Carriker, an Air Forces captain and genial major domo in the land of the Bula Boys, belongs in the Airways Baedeker because of his startling waxed mustache. There is the flat coral island that has its level monotony broken by one lonesome palm tree. There are the sunsets, some of the Pacific's best, viewed from the sagging canvas chairs on the veranda of the Fiji Officers' Club.

MUCH of the credit for pioneering the Southern Cross Airways should go to civilian pilots flying under contract to the United States Government and to RAAF Ferry Command flyers. Captain Ernest W. Gray of San Diego, California, is typical of the commercial skippers who are keeping Australia closely linked to the United States. Gray was a veteran of the Pacific even before we got into the war, having twice delivered British-purchased PBYs to the Philippines. He was on his way to Wake Island the morning the Japs took their stab at us. He was delivering a plane destined for Singapore and was between Midway and Wake when he got word to turn back. He spent that night at Midway, sitting in a dugout while Jap cruisers and destroyers shelled the place. Captain Gray returned to Honolulu and the mainland, but the following March found him on his way again, this time delivering a B-25 to Dutch flyers in Australia. Today Captain Gray is taking C-87s back and forth to Australia.

Captain Stan Young, another commercial pilot who was on the South Pacific run in its early days, illustrated the type of flying that was sometimes needed to get planes through from one island to another when he flew a four-engine bomber for five hours with number one and two motors out. He had a new crew on board, but his experience brought them through, despite the fact that to keep his altitude he had to heave all loose baggage and gear into the Pacific.

The record made by the Southern Cross Airways in its day and the record the ATC is making today in moving cargo and personnel foreshadow a tremendous Pacific air transport system in post-war days. A veteran flyer of the Pacific air route pointed out what it may be like when he said:

"Even under the inconvenience and uncertainties of a war we have airfields out here in the middle of the ocean that compare favorably with many metropolitan airports in size and ability to handle traffic. After the war — after we beat the Japs — there will be so many planes flying across the Pacific that it will look like the vicinity of a training field. From the States to Australia in thirty hours or less, and to the Philippines or China in a day and half. As for Japan, she probably won't be worth flying to." ☆

IT WAS a cold gray morning in February at an American bomber base on the Tunisian front. Shivering groups of men, flying crews and ground men, lined the south edge of the field watching the sky to the east.

Tiny specks that soon grew to be planes appeared on the horizon. Anxious eyes counted them, then an excited voice shouted: "I count nine. They're all back!"

A buzz of relieved conversation and then the planes were circling to land. B-26 Marauders, coming in low and hot, like they always do.

By the time the last plane had landed, the Major who had led the flight had been picked up in a jeep and whisked back to the operations tent.

"Ran onto a big Axis convoy out there," he said to the eager crowd around the tent. "We got two ships, but they sure threw the flak at us. My wings look like a screen door."

Already the operations officer was on the phone giving a brief description of the raid to higher headquarters. Suddenly, he put the phone back in its little leather box.

"We're going back after the rest of that convoy," he announced. "This is one they've been waiting for, and it's carrying a lot of important stuff. Every one of those ships that gets through now may delay our cleaning up Tunisia by three weeks."

"We'll use different pilots and crews, but we'll have to put most of those same planes in the air again."

The operations officer called for the group engineering officer, Captain Warren S. Bradford of Kingston, Massachusetts.

"Get at least six of those ships that just landed ready to go on another mission early this afternoon," he said.

"Yes, sir," said Captain Bradford.

Bradford hurried out to the planes where squadron engineering officers, aircraft inspectors and mechanics were looking over the damage done by Axis marksmen.

He delivered the news of the new mission to Warrant Officer George O'Dell of Missouri, an engineering officer, and Master Sergeant Howard S. Scott, Jr., of Fort Worth.

"But some of these ships have got a lot of flak holes, and we've got no metal to patch them," protested Sergeant Scott. "It's in some of that equipment we haven't been able to get shipped up here yet."

"We might put three in the air without any work, but at least three will need patching," explained O'Dell.

"Then put all your men on those three and find something to use for patching, anything you can find," said Captain Bradford.

It was several hours later when a G. I. truck loaded with flying crews, colorful in their yellow "Mae Wests" and white parachute rigging, pulled up to the planes.

Ground crews were just ending their



"GET THE JOB DONE"

By Lieutenant Gordon H. Coe

work, putting on finishing touches. A pilot walked over to a little knot of mechanics.

"Say, what did you use to patch those flak holes in this plane?" he asked.

"I patched some with the bottoms of five-gallon gas tins," said Tech. Sergeant John D. King of Fort Worth.

"I used linen patching," exclaimed Tech. Sergeant Harry C. Engle of Chicago. "It was the kind of patching they used on fabric planes before they made them of metal."

"Holy smokes," exclaimed the pilot, squinting at a patch. "Will they hold?"

"Sure," said Sergeant King. "Maybe not for months, but for a few weeks, anyway."

"I'll take your word for it," the pilot remarked as he turned away.

And in a few minutes another formation of B-26s headed for the Mediterranean "hot spot" between Sicily and Tunis to knock out more of the shipping needed by the Axis to supply its Tunisian forces.

That was just one dramatic example of the way ingenuity and hard, grueling work by Army Air Forces ground crews during

the early days of the Tunisian campaign kept planes in the air despite hardships and handicaps, and helped lessen German "staying power" in that vital theatre.

Moreover, it's an example of what mechanically adept American boys are doing to keep planes flying all over the world. Their motto is: "Get the job done." If vital supplies go down on sunken ships or are delayed by difficult terrain and bad weather, then something else will have to do until the supplies arrive.

NOTHING is called impossible until it's been tried and proven so.

Seldom, if ever, has more been done by an air force group with less equipment than by the B-26 outfit about whom this story is told.

"Yet we actually maintained our ships for a long while with little more than a screwdriver and a pair of pliers," said Warrant Officer O'Dell.

"Because of the nature of the campaign, we began operating in the African theatre long before we expected to start," he explained. "Much of our tools and equipment were still in England, and replacements were hard to get in Africa then."

ILLUSTRATED BY
CAPTAIN RAYMOND CREEMORE

"Things are well organized here now, and most new groups coming over are pretty well equipped when they land. But, of course, there is still plenty of chance to improvise, and it will never be like aircraft maintenance in the United States."

"A kit with between 100 and 200 special tools is considered the minimum with which to maintain airplanes of our type back in the States," O'Dell continued. "Yet, I remember one day when two of our crew chiefs (Tech. Sergeant Harry F. Beals of San Antonio and Staff Sergeant Robert E. Farnsworth of Akron) set out to repair a plane and get it into the air with only a pair of diagonals, a crescent wrench, a screwdriver and a pair of pliers to work with."

Sometimes there was only one tool of a special type in the whole group. That meant hours of waiting by one crew while another used the precious tool. It meant miles of walking every day, too, for the planes were widely dispersed to avoid being a good target for Nazi bombers.

Spare parts were non-existent in Africa in the first months of the Tunisian campaign. So, when an airplane came back from a mission too shot up to be used again or had to make a "belly" landing, mechanics swarmed over it like vultures. Shot-up planes served as "warehouses" of spare parts for airplanes still able to fly.

An important part of working on an airplane engine is being able to reach it, but those handy metal crew chief stands on which mechanics stand while at work weren't available when this outfit went into action.

"Mechanics stood on barrels, balanced on flimsy sawhorses and hung precariously from wings to work on engines at first," O'Dell recalled. "Then we found that one of the flight chiefs, Master Sergeant Hubert J. Treille of New Orleans, spoke excellent French. From a nearby French army unit, he got some big window frames, and we made some crude stands from them. Even then we didn't have too many, and it was a major tragedy when a bomb got two of our five stands and two tool kits one morning just before dawn."

Changing tires on the big planes looks impossible without the big wing and nose jacks that are standard equipment in the Air Forces. Yet it was done dozens of times by ingenious ground crews.

To change a nose wheel tire, they raised the nose by having ten men get into the tail of the plane. Then fifty-gallon oil drums were placed on either side of the nose with heavy timbers between them to support the nose. With this accomplished, the nose was lowered onto the timber supports by having one man at a time come forward out of the tail.

"Once the plane was jacked up like that," said O'Dell, "we'd cross our fingers and hope another plane wouldn't taxi by too close and blow it off the blocks with its prop wash."

To change a main landing gear wheel

Ground crewmen of this B-26 group in Tunisia scored a victory with screwdriver, pliers and a patch of tin.

tire, the men would block up under the wing to keep the tire up, then dig a hole under the wheel. After the tire was changed, the plane had to be taxied out of the big hole. They nearly burned up the motors occasionally but planes were always ready for their missions.

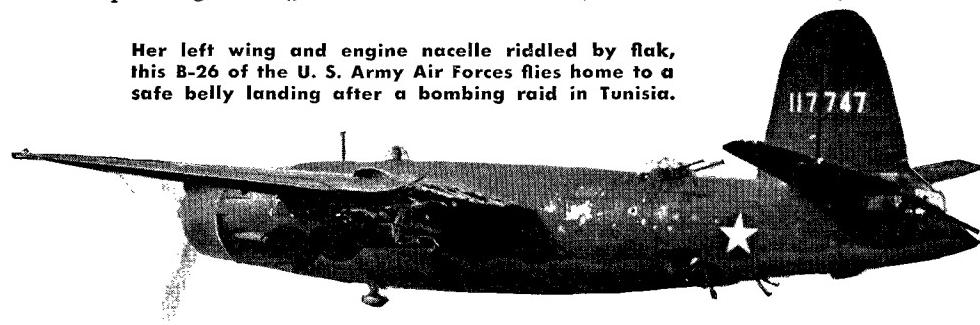
Improvisations were the order of the day. They were so common nobody even discussed them.

There were no air compressors available, so tires were pumped up with a compressor on a British army gas truck. The men had to wait for an American transport plane to land at the field if they wanted to pump up the landing gear shock absorbers. The transports carried booster pumps.

Mechanics "borrowed" an old French battery charger to keep up batteries. Several times, bullet holes in the self-sealing rubber fuel tanks on the planes were repaired with a tire patching kit from a G. I. truck. The patches last several months, too, although 100-octane gas eats up regular rubber cement.

Auto-wrecking trucks were used to change the big, 800-pound propellers on the B-26s. But ten men had to exert all their strength to raise the prop the last few inches because the wrecker's winch wasn't quite high enough.

Her left wing and engine nacelle riddled by flak, this B-26 of the U. S. Army Air Forces flies home to a safe belly landing after a bombing raid in Tunisia.



One day during a period of bad weather, the group was asked to bomb an Axis airfield near Tunis despite the adverse flying conditions. Pilots were willing, but the vital rubber de-icer boots on some of the planes were in bad shape and needed patching. For an hour the whole group was at a loss as to where the necessary rubber, scarce even in the States, could be located in Africa.

Finally a young mechanic hit on the solution. Several rubber life vests were torn up, and the rubber used to patch the de-icer boots.

The mission went out on schedule, caught thirteen Axis fighter planes on the ground and destroyed them. All our planes returned safely through an icy overcast—thanks to some worn-out life vests.

Welding and soldering were out of the question until a French construction company arrived to enlarge the air base. Sergeant Treille was pressed into service again, and soon the contractors were doing all the welding and soldering for the group.

For a while the big gas tanks on the planes had to be filled by hand from five-gallon cans—an endless, back-breaking job. Later, small British gas trucks with hand pumps were used, but all the gas from these trucks had to be strained through a chamois-skin held by hand. American automatic gas-tanker trucks finally relieved that problem.

Once an air-oil strut was found to have a crack in it. Sergeant Treille got the French contractors to solder it—something unheard of in plane maintenance in the States—and the strut is still holding.

The lack of tools and equipment also affected the armament and ordnance crews. Ordnance men often worked most of the night in the freezing cold and under a strict blackout to load bombs for the daily missions.

BAD weather was a thorn in the side of the ordnance crews in more than one way. If bad weather caused cancellation of a flight for which bombs had already been loaded, those bombs had to be taken out of the bays—always a ticklish job—and another type loaded, because a change in targets usually meant different types of bombs would be used.

Loading and unloading bombs in the pitch-black cold of an African winter night was a job that called for steady nerves. But

no mission ever failed to go out because bombs were not loaded. Ordnance crews headed by Captain Herbert Hartman of Newton, Kansas, are proud of that record.

Armament men who maintain the deadly .50-caliber machine guns on the B-26s also did their jobs well without full equipment.

"If you keep thinking that if a gun isn't in perfect condition it may cost the life of one of your buddies, you'll always find a way to keep that gun in shape," explained Lieutenant John R. Campbell of Stanton, Tennessee.

In all, the record of this one outstanding medium bomb group shows that the Army Air Forces' careful training program, plus Yankee ingenuity, pays off in seemingly impossible feats in the field of operations. ☆

HAVE THE BEST CREW OF THEM ALL

IN THE DRIVER'S SEAT

By Capt. William J. Crumm, pilot

WHEN you've got your B-17 bouncing and weaving over Europe like a bucking steer, dodging hellishly close flak and giving your gunners a crack at swarming enemy fighters, you realize for the first time just what they meant back in O.T.U. when they told you a good crew was the most important element in combat bombardment flying.

Old "Jack the Ripper"—that's what we called our B-17E—was saved from many a plastering simply because the sharp eyes of our gunners detected an enemy fighter slipping in from out of the sun, or judged the accuracy of flak almost before the stuff began popping. We hit many a target on the nose because our bombardier knew his stuff and wouldn't allow all the shells and machine gun bullets in the world to distract him when he was lining up his sight during a bombing run—and, because our navigator could hit a landmark on the head almost with his eyes closed.

We honestly believe we have the best crew of them all. And we know that other crews think they're the best. That's the way you should feel. Not cocky. But knowing you are the best because hard work and confidence in each crew member has made you the best. We don't have any individualists in our outfit. If you have a man playing for himself get rid of him because he can ruin you in combat.

You usually will know between four and five o'clock in the afternoon when you are to take part in a raid the next day. On the

morning of the mission you are aroused between 4:30 and 5:30 for breakfast and detailed briefing.

About an hour before take-off time, the pilot and co-pilot report to the ship and personally inspect the engineering, oxygen equipment, ammunition, guns, parachutes, life vests, clothing and first aid kits, and they talk with the other crew members. To me this inspection check is the most important duty of the pilot. Failure to do so may lead to unnecessary turn-back and even loss of personnel.

Once in the air and after leaving the coast of England, your gunners should test fire their guns. If a gun is out and continues to function improperly after a check-up, the pilot must then maneuver his ship in the formation to assure maximum coverage of the "dead spot" in the firepower.

A turn-back due to gun failure results in a weakened formation and exposes the single returning aircraft to intense enemy attack. I know of several instances where a returning ship has been surprised by enemy fighters and shot down. The wise pilot makes it clear that he does not intend to turn back because of gun failure or oxygen trouble so the crew will be kept alert and careful to check on all details prior to take-off.

From the time you leave the English coast, your ship is in constant danger of enemy attack. Your gunners must stay mentally alert and keep on the lookout for fighters. It may take only one burst from an enemy fighter to raise havoc with your plane. On several occasions we were attacked in mid-channel on the way over.

Whenever there's a lull in activity keep the crew chatting over the interphone. Talk about anything. This is one sure way to keep the boys on their toes.

AIR FORCE, July, 1943



Impressions gained by crew members of a B-17 during eleven operational missions over Germany and Occupied France.

Once over the European Channel coast, the fireworks usually begin. Sometimes the enemy will throw up light flak at first. This flak is white in color, and white puffs usually indicate flak with an effective range of about 15,000 feet. This was always beneath us. Now and then enemy batteries will throw up flak with pinkish bursts apparently for psychological effect and as deterrent fire. Flak with black puffs is the heaviest and is effective up to an altitude of about 35,000 feet.

Unless you are going on raids deep into France or Germany, you seldom encounter fighter opposition until you are fairly near the target area. We found this particularly true when bombing submarine bases along the French west coast.

Enemy fighter tactics, as far as our experience is concerned, differ decidedly over France and Germany. In our first raids over Germany late last fall, fighters attempted to press head-on attacks but they seemed to lack the experience and finesse of the older pilots we later met over Western France. After several unsuccessful attempts at head-on attacks, they would revert to attacking the tail and beam, coming in from either side. Fighters seldom used the sun to advantage in our raids over Germany.

In Western France the attacks almost invariably came from between eleven and two o'clock. The fighters—mostly Focke-Wulf-190s in Western France in contrast to almost all types in raids over Germany—would climb and fly parallel to our formation at a distance of some 1,500 yards, just out of range. They usually approached in groups of four, flying in trail. They would fly out in front of our formation about two miles, then peel off and come in head-on, the rate of closure being about 600 miles an hour.

It was at this point that we could distinguish between an experienced pilot and a novice. The veterans would close in to within 200 or 300 yards before firing and if they were too close for a safe break-away, they would fly directly through our elements. You could almost count their whiskers on occasion. A standing comment on returning from a raid in Western France was: "I saw the guy with a red mustache again today." They came that close. Otherwise, the veteran's tactics were to roll over and dive straight down beneath the formation, exposing themselves to our gun fire for the least number of seconds.

Newer pilots, on the other hand, very often failed to bring their guns to bear because they would misjudge and overshoot our entire formation. Or else they would break away before they were within effective range, sometimes without even firing a shot at us.

We found that the most effective type of

evasive action taken in formation against these enemy fighters was to dive into the attackers. This would increase the rate of closure, throw off the fighter's line of sight and at the same time give our top turret gunners a crack at them.

In a situation like this a pilot has a three-fold job. He must fly a good formation, which, I might add, is the best life insurance in the world. German fighters always go for the loose formations when they can find them, and a straggler really catches hell. Secondly, the pilot must know the direction of the attacks. And, then, he must maneuver his ship to bring as many guns to bear as possible. A good interphone system is absolutely essential if he is to accomplish all three jobs, for there must be split-second communication between all crew members.

Not only does he fly in a good formation but a wise pilot takes individual evasive action. He changes elevation, skids, trying at all times to bring maximum firepower to bear against attacking planes. However, he must keep his relative position in the formation—and tight—to avoid lagging behind.

Evasive action must be continued after the turn on the target from the initial point, which is usually about five minutes away, up to the time the actual bombing run starts. Then it is up to the pilot to fly as level as possible, making any corrections in formation smoothly, in order to keep the gyro in the bombsight from "spilling."

Violent evasive action is frequently necessary both before and after a bombing run. In a raid on the submarine installations at Lorient on January 23, evasive action was the only thing that saved us at one or two stages of the mission.

The trip home is usually every bit as rough as the trip in, sometimes rougher. So don't let your men relax for a second. The pilot must fly a good formation until he peels off into the traffic pattern at his home field. Other crew members should keep on their toes right with him.

Remember a well disciplined, hard-fighting unit is hard to beat. Train your crew to be able to cope with any situation without losing their heads and you'll have very little trouble in combat.

NAVIGATING OVER EUROPE

By Lt. William C. Leasure, navigator

THE many tasks that fall to the lot of the navigator on combat missions are difficult to realize until he actually gets in the fight. At least, that's the way we found it in England.

You realize, of course, before you go out for the first time that your primary job is to get the plane over the target and back home

again. But in many respects, accomplishing this from a base in the British Isles is anything but the simple application of training received back home.

For one thing, we found that precision pilotage is the mainstay of navigation in the British Isles and the only navigation method which gives the accuracy needed for successful precision bombing. It is imperative, for instance, that the navigator know where he is at all times, frequently within one-quarter of a mile.

NAVIGATORS and bombardiers in O.T.U. who may see service in England should obtain all possible practice in pin-pointing at altitudes of 20,000 feet and up—and from 1,000 to 1,500 feet. Most of our flying was done at one or the other extremes.

On the average mission it is the job of the lead navigator to find the target and for the most part he employs pilotage. Wing ship navigators do not have to be so



exacting although they should always know within a few miles the position of the formation. Even during the run from the base to the British coast, you must keep the other crew members informed over the interphone as to their whereabouts. And it is wise to follow this procedure whenever possible throughout the flight. Such information as your location, the time when approaching the enemy coast, when enemy fighters may be expected and when the target is being approached proves a great aid to morale and tends to aid in welding the crew together as a team. This should be a primary function of the navigator.

I might add that all hands should be notified on the return trip just when friendly fighters may be expected. This prevents firing on your own pursuit planes.

The bombardier and navigator should know each other well and work together perfectly. At altitudes from which we operated, the target could usually be seen 20 to 40 miles away. When you spot the target you should point out to the bombardier a landmark near it so he can use pilotage in lining up for the run. It is your job to give him a heading that will require very little drift correction.

During the last ten minutes on the target approach, interphone silence is generally observed by all but the navigator and

bombardier. We found that this prevented needless confusion.

If attacked by fighters during the bombing run, the navigator takes over both his and the bombardier's guns, firing from whichever station will best meet the attack. When the bombs are away, it is the navigator's duty to note the time, heading, altitude and air speed. He also must determine hits and damage, obtaining reports from other crew members. The ball turret operator is especially well situated to report on damage.

During action—or at any time on a mission, for that matter—the navigator must note on his log any of our planes seen to go down, the time, location and whether anyone was seen to bail out. Reports of enemy planes shot down also must be reported by crew members to the navigator who enters the information in his log.

Although a navigator has his hands full the entire trip, the time spent near the target is a particularly busy one for him. After bombs are away and the plane is turned about on its home course, the navigator must take care to remember flak installations and avoid them. With the lead navigator pacing the formation homeward, wing navigators have plenty of time for shooting in the case of enemy fighter attack.

Every navigator should learn his gun as well as the theory of sighting. Tracer firing is deceptive and not very satisfactory. Each navigator cleans his own gun in combat theatres and in this way gets to know exactly how it operates and just what to do in the event of stoppage.

Although they have more time for firing on the way home, all navigators in a formation should know within a relatively close margin what their position is because one of them may have to take over the lead navigator's duties if he is wounded or the lead plane shot down. From the British coast to home station ALL navigators must know their position to within a quarter of a mile, not five or ten. All England looks alike and any one of the navigators may be required to take over the formation at a moment's notice. Moreover, it is particularly important to know your exact position at this stage since sometimes there are wounded men aboard your ship or other ships and no time should be lost in needless guesswork. Ships which have injured men aboard shoot a red flare and are permitted to land first.

Your job is by no means over when your ship rolls to a landing. In the interrogation by intelligence officers the navigator is a key man for he has kept in his log a complete and exact story of the mission.

HITTING THE TARGET

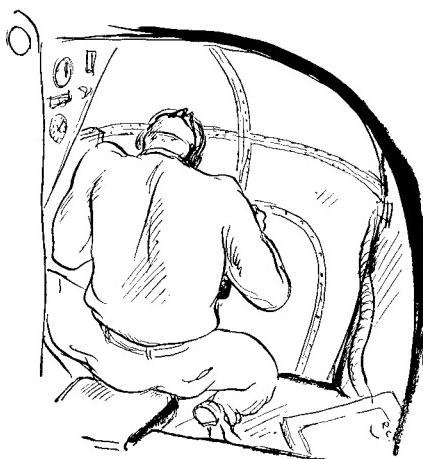
By Lt. Robert L. Kleyla, bombardier

WHEN you have your eye glued to that bombsight and are making ready to shout, "Bombs away!", you can't let a little thing like exploding flak and enemy fighter planes bother you too much. But the mo-

ment your load is dropped, you can grab your gun and start shooting.

That's just about the size of a bombardier's job over a target in France or Germany. However, unless he does his primary job well, the bombardier wastes a mission, and a lot of good men and equipment have been exposed for no good reason.

Before you leave on a mission it's your job to have a clear mental picture of the target you are supposed to hit. If you don't it's your own fault. At briefing you get a complete run down on the prospective trip



over the Continent. You know the size and number of bombs, the route in and out, weather reports and the zero hour or time for crossing the British coast on the way out. The group C. O. projects on a screen maps of the target section and pictures of the target itself. The bombardier is informed of dummy installations, ways of avoiding them and hitting the real target.

IN addition bombardiers get together later for a special briefing, during which they may request maps and pictures of the target area to be flashed again on the screen. They are given the opportunity to recheck the meteorological officer for such data as ground, air and mean temperatures at the target, and pressure tendencies in the target area.

By the time the bombardier visits the bombsight vault to get his sight, he should know all the information available on the target for the day. Before take-off, he should check the bomb load, his sight, the bomb racks and bomb bay doors, switches and any other equipment he might use on the flight.

In order to insure proper performance of his secondary job—that of shooting enemy fighters—a bombardier should check and recheck his gun before the mission.

As your ship gains altitude on a mission, you convert all data obtained from the metro officer. During the early stages of a flight, I also made a practice of memorizing some of the bombing tables so that if we failed to approach the target under exactly the conditions given at briefing, corrections could be made quickly and without confusion. I generally marked possible variations in pencil on the disc drum so they could be made with the least amount

of trouble. By setting all the values possible in the sight at this time, you have more of an opportunity to man your guns.

A bombardier should learn pilotage well, particularly from higher altitudes. This knowledge can be put to valuable use when the navigator gives you a landmark near the target after you have approached to within 30 or 40 miles. On reaching the advance initial point in the target approach, the bomb bay doors are opened. This is done for two reasons: Enemy fighters are unable to ascertain which target is our objective (there usually are several potential ones in any given area), and the pilot is given a chance to correct for air speed and altitude with the doors opened.

In making a bombing run in formation (which is usually the case), the lead bombardier sights for deflection and range; the wing bombardiers, for range only. Then, too, wing bombardiers may drop either on the lead bombardier or by their own sightings, depending on instructions at briefing.

It is your job to observe results whenever possible and to obtain reports from other crew members. At times you carry a camera. At least two or three ships in a formation are equipped with them and most of the time they are operated by the radioman on instructions from the bombardier.

On returning from a mission the bombardier supplies the intelligence officer with the number and types of bombs dropped, fusing data, results observed, altitudes, time of attack and the like.

All during our experience on combat missions over Europe I was particularly impressed with the value of plenty of high altitude bombing practice by the bombardier. Get in all you can in training because it is sure to pay off in bulls-eyes later. In addition, you can't get too much gunnery training. Learn how to sight properly and know the nomenclature and the action of your guns so you can feel you are getting the most out of the shots you are sure to have at enemy fighters.

The bombardier's got a hot seat on any combat mission but to me it's the best seat of them all. You get a peculiar feeling when the flak starts popping almost under your nose and the fighters come in so close you begin to think they want to roost in your lap, but it's all worth it when you drop your bombs where they'll do the most good.

RADIOMAN IN COMBAT

By Tech. Sgt. Peter F. DeBoy,
radioman

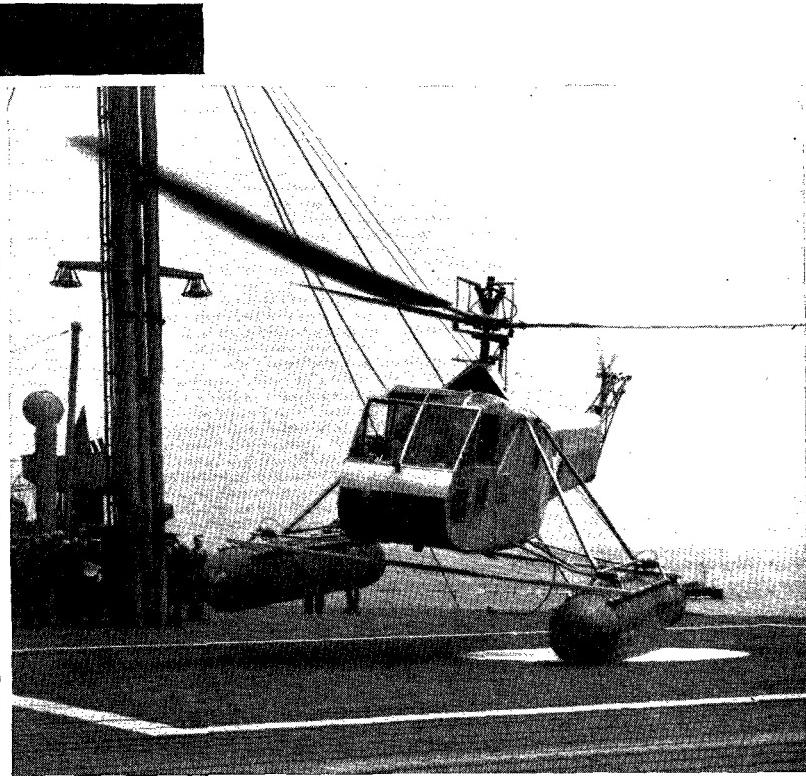
IN ENGLAND the radio operator isn't a passenger any longer. Combat has given him an important twofold job.

On operational missions from the British Isles he maintains radio communication while over friendly territory and in doing so serves as a valuable second to the navigator. Away from the British coast, where complete radio silence is observed except in emergency, he is a gunner—and may become an all-purpose one.

(Continued on Page 40)



The Army-Sikorsky helicopter takes off from a moving tanker.
Right, landing again on deck.



The Helicopter Gets Sea Legs

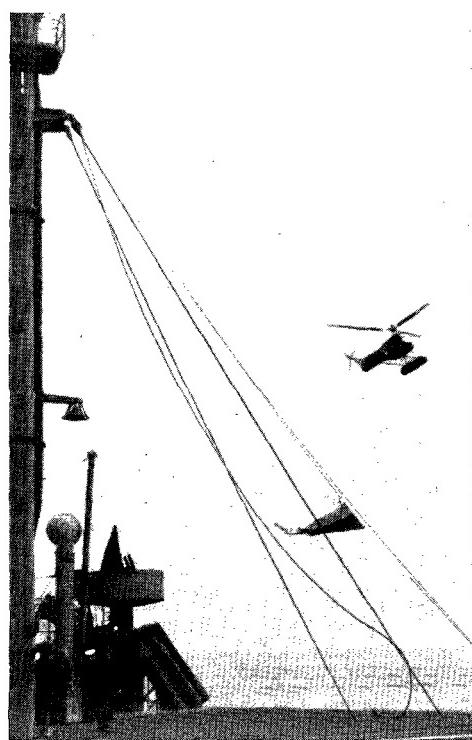
An Army-Sikorsky helicopter recently made approximately 24 take-offs and landings on the deck of a moving tanker on Long Island Sound, marking the latest step in the military development of this wingless aircraft.

Colonel H. F. Gregory, the Air Forces' helicopter expert (author of an article describing the military possibilities for this type of aircraft in the March issue of AIR FORCE), piloted the ship in the demonstration staged at the request of the War Shipping Administration as a potential means of combatting enemy U-boats.

The Long Island experiment was conducted from the tanker's deck, which offered a space 78 by 48 feet for take-offs and landings. Immediately fore and aft of this space were housing and mast superstructure, leaving only side and vertical approaches.

The first take-off and landing were accomplished with the tanker comparatively motionless, but for the remainder of the demonstrations the vessel was under steam up to maximum speed.

Colonel Gregory, who has been the project officer for the development of the helicopter at Wright Field, not only took the ship off, flew away from the tanker for some distance, returned and landed but also demonstrated the ability of the helicopter to hover above the tanker and land in different positions, on the deck space.



With the tanker under full steam, the Army-Sikorsky helicopter demonstrates its ability to hover nearby.

The helicopter was equipped with flotation gear which permitted Colonel Gregory to make two successful landings on water

near the tanker. The ship can land on a deck as well as water with this equipment since there is no roll of the helicopter on landing. This factor was further demonstrated by three flights, each with a passenger, from the tanker to shore and back again.

The flights took place over a period of two days, with representatives of the Army, War Shipping Administration, the British Royal Navy, the British Air Commission, the Coast Guard and others among the witnesses.

Engineers and pilots of the Materiel Command at Wright Field had recently completed the experimental testing of the machine. Since last summer, take-offs and landings had been made from a comparatively small raised platform, so it was no problem to carry on the same type of flights from a ship's deck. The only difference came in the movement of the landing area, and this factor offered no obstacle, in view of the helicopter's ability to rise and descend vertically; fly backward, forward and sideways; spin like a top about its vertical axis, and hover motionless in the air.

Incidentally, the Long Island Sound demonstration added two more "firsts" to the list held by the Army's helicopter: the first take-off and landing of a helicopter on a ship deck and the first helicopter ship-to-shore ferry service. (Continued on Page 18)

TECHNIQUE

Rear Admiral Howard L. Vickery, vice chairman of the Maritime Commission and Deputy War Shipping Administrator, issued the following statement in Washington after the demonstration:

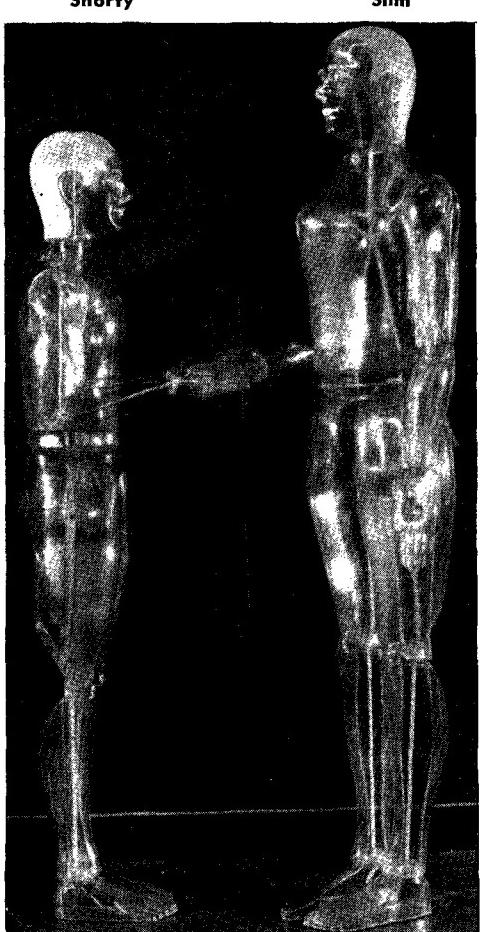
"Under the circumstances existing at the time of the demonstration of helicopters' ability to take off and land on the deck of tankers, the United States Maritime Commission and the War Shipping Administration believe that the feasibility of the operation has been sufficiently proved. These agencies are now preparing a plan for a small deck to be installed on Liberty ships without interfering with the cargo arrangement, which will permit helicopters to be used at sea, thus giving the ships added protection from submarines."

Clover Seed Cleaner

Clover seeds are speeding up the cleaning of pistons and cylinders in the engine repair shops of the Sacramento Air Depot, California. It's the idea of Frank Perry, civilian aircraft mechanic. The seeds, which will not clog up delicate machinery parts, are blown against the parts to be cleaned by a small sand-blasting machine.—PRO, McClellan Field.

Shorty

Slim



Manikins for Plane Designing

Just as a tailor fits a suit to an individual, AAF engineers are now fitting airplanes to the men who will fly them. Aerodynamic design comes first but no longer are the tall men or the short men ignored in designing turrets, cockpits, emergency doors and passageways.

Three synthetic men—transparent plastic manikins—now are influencing design of aircraft installations to a greater extent than any other three men in the country. Each is an average sized pilot, representing the tallest, the shortest and the medium of 2,954 cadets formerly at Kelly and Maxwell Fields.

These three silent men already have been responsible for changes in some installations of production model aircraft. Turrets, for example, have been modified in the last three months to give air crew members more room for effective operation of their guns. Upon the recommendations of the "human engineers" who fathered the manikins in the Wright Field Aero-Medical Research Laboratory, practically every type of ball and top turret now has undergone alterations to give the gunners more room.

Slim represents the tall five percent of our pilots, who average six feet, one and one-half inches, and weigh 172 pounds. Shorty stands in for the short five percent, who are five feet five and one-half inches tall and weigh 140 pounds. The remaining ninety percent, who average five feet, 9.2 inches and 154 pounds, are represented by Roger.

Slim, Shorty and Roger are used as the standard yardsticks now in all plane designs. They are flexible, lightweight and sturdy and can wear flying clothes like an Esquire model.

The trio is used to solve problems of adjustable pilot seats, location of instruments where any sized pilot can see them, proper placement of controls so both short-armed and long-armed men can operate them with equal ease, and of the hundreds of equipment items involving proper eye level, adequate elbow room, height clearance, passageways and seats of proper width, knee room, cockpit roominess, and so on.

Before Slim, Shorty and Roger were created, aircraft designers were using statistics and "typical guys" working around the shop. In such cases, however, there was too much chance for human error in measurements and the "typical guy" sometimes turned out to be not-so-typical.

If an airplane crew does not have room to perform its duties efficiently in the air,

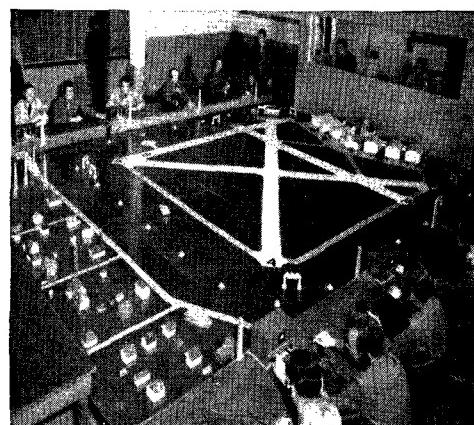
the plane becomes inefficient. To get the maximum performance from plane and crew, the AAF Materiel Command Aero-Medical Laboratory inaugurated its program of building synthetic men as yardsticks for aircraft design.

In 1940 a conference between Colonel O. O. Benson, Aero-Med Laboratory chief, and Dr. E. A. Hooton of Harvard University, one of the country's leading anthropologists, laid the groundwork for Slim, Shorty and Roger. Some time later, measurement statistics of almost three thousand cadet pilots were recorded and classified. During the research dimensions of variously shaped heads also were tabulated to assist in the design of properly fitting oxygen masks.

Upon completion of the investigation the three average sized pilots were defined and head shapes reduced to seven typical forms representing 98 percent of the men in the Air Forces.

With the specifications written for the first time, sculptors were put to work making models of heads and full sized statues of the average man. Flexible manikins were molded from transparent plastics.

Now, after three years of extensive research, Slim, Shorty and Roger have been created and delegated to devote all of their time to helping aircraft designers make combat aircraft more comfortable and better adapted to efficient operation by crew members.—Lieutenant Robert V. Guelich, Wright Field.



Model air base in action at Chanute Field.

Miniature Air Base

Operation of a miniature model airport, 16 by 24 feet, complete with floodlights, obstacle lights, wind indicator and radio towers, is a feature of the final phase of the Control Tower Operators training course at Chanute Field, Illinois.

Technical Training Command students sit on two sides of this miniature field with

its hangars, runways, aprons and model aircraft, and communicate by radio with the student operator in the model control tower at one end of the field.

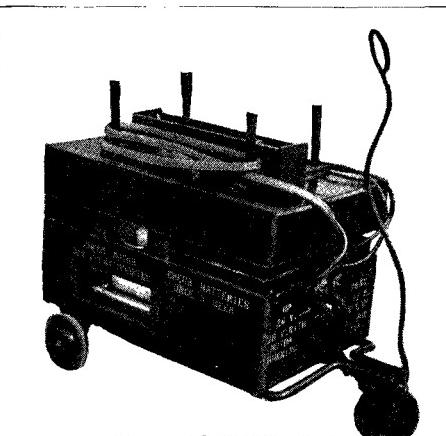
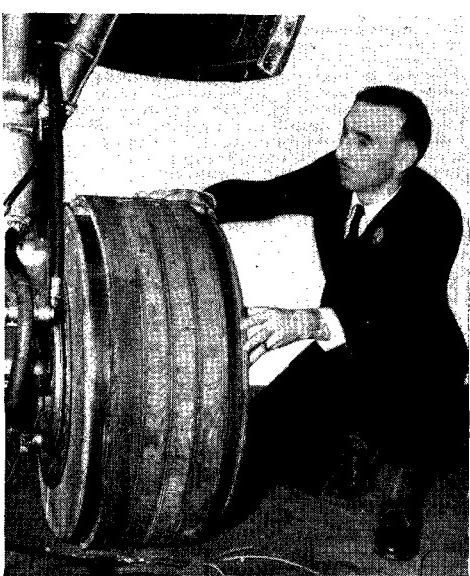
Each student, representing the pilot of a plane, has a card stating his problem, which may involve either coming in for a landing or preparing for a take-off. The student operator then has the problem of handling all planes and giving pilots necessary directions to assure safety and compliance with air traffic regulations.

The miniature was originally built by the 4th Airways Communication Regulation School at Smyrna, Tennessee, but was brought to Chanute Field where it was renovated and expanded after the course was moved to Illinois late last year.

The Control Tower Operators course is under the Department of Link Trainer and Teletype, Captain Ray D. Dallmeyer, Director. Instruction is given by First Lieutenant D. L. Morgan and Warrant Officer R. G. Phillips, both veteran control tower operators.—**First Lieutenant T. V. Watson, Assistant Public Relations Officer, Chanute Field.**

Wooden Wheels

Borrowing the idea from private airplane manufacturers, maintenance shop crews at the Sacramento Air Depot are using wooden wheels to replace rubber tires on aircraft while the planes are undergoing repair. The wooden wheels serve to protect the rubber tires from damaging grease and oil while the aircraft is on the repair line. Inspecting a wheel (below) is Clinton B. McElheney, shop superintendent in the maintenance division.—**Public Relations Officer, Sacramento Air Depot, California.**



Improved Battery Cart

An improved battery wagon has been designed and built at Barksdale Field by Staff Sergeant O. J. Naquin. It fits any AAF airplane, is suitable for field conditions, and charges its own batteries. The cart will adapt to 12, 24 or 28 volts. Made from salvaged materials the wagon is stenciled to insure correct procedure by "alert crews."—**Captain Harry B. Barnhart, Barksdale Field, Louisiana.**

Starter Wrench

To speed up the starting of nuts on bolts in inaccessible points on aircraft, Corporal Walter Ott of the Army Air Base at Casper, Wyoming, devised a starter wrench. His device is expressly designed for use on mounting bolts of inertia starters and batteries of B-17Fs.

The tool consists of a $\frac{3}{16}$ inch shaft, ten and one-half inches long and enclosed in a copper tube. At one end of the shaft is a knob and at the other a series of three gears which are turned by the shaft, thus causing a socket mounted on the third gear to rotate. The nut to be installed is placed in the socket, and the knob is turned to start the nut on the threads of the bolt. The nut is tightened with a standard wrench.—**Captain James A. Hilton, Army Air Base, Casper, Wyoming.**

Artificial Horizons

Taking off at night into a background as black as the inside of a tomb is no cinch for an experienced pilot. Add inexperience, instrument lag, a fast modern bomber that won't climb immediately, and you have a potential accident.

In fact, a recent Third Air Force study discloses that these conditions have caused crashes because young inexperienced pilots unable to compensate for instrument lag have a tendency to let a plane nose to the ground.

A solution was found that should be of interest to all bases where a similar hazard

exists: Provide the pilot with ground contacts so he needn't go on instruments until he gains altitude.

A good deal of credit for development of the idea is due Lieutenant Colonels Clint T. Johnson and J. T. Winstead, Base and Group Commander, respectively, Avon Park Bombing Range, Florida.

From odds and ends of equipment a lighting system was created at this Florida base which will be duplicated throughout the Third Air Force. The system is called an "artificial horizon."

The lights were installed about two months ago following the crash of two B-26 aircraft, each of which apparently had been caused by the failure of the pilot to orient himself with the ground. There have been no similar accidents since.

The "artificial horizon" consists of six clusters of red lights fanned out at a 20 degree angle for two and one-half miles from the runway's end.

The fan arrangement was selected so the lights would remain in view of both the pilot and co-pilot as the rising nose of the plane restricted forward vision. The length was calculated to give ground contact during the first minute of flight—a period of instrument lag, cockpit activity, and low altitude operation.

The light banks were constructed of materials found around the base. Each is made up of six 200-watt bulbs painted red, strung six feet from the ground in a box shape 20 by 30 feet. Two clusters were placed half a mile out; the next two, one and a half miles, and the final pair, two and a half miles. The last two banks are approximately 4,500 feet apart.

To avoid the delay entailed in obtaining miles of wire to connect the clusters with the regular power source, the commanders decided to use portable generators. The base's aviation engineering battalion scraped together six units and provided the men to operate them.

The permanent installations will be patterned after the Avon Park model, according to Colonel E. H. Walter, commander, Corps of Engineers, Third Air Force. Minor modifications of spacing may be necessary depending on the type of plane operated at a station and strings of lights instead of clusters may prove effective at some locations, he said.

The installations will become a regular part of a field's lighting equipment, controlled by a switch in the tower.

"If we save only one bomber," Colonel Walter explains, "that's a quarter of a million dollars, not to mention the lives."—

Flight Control Command, Winston-Salem, North Carolina.



TAXI. Going to town sometimes means a jaunt like this.

PARLOR, BEDROOM and SINK

LIFE at Allied air bases in North Africa is not always one bombing run after another, nor is it necessarily a continuous round of engine-repairing and bullet-hole patching. Behind the aerial offensive against Axis targets in the Mediterranean area are hours spent in such personal pursuits as tidying up for a visit to town, matching wits with the natives, athletics, old-fashioned bull sessions, Sunday worship, dreaming of home, and the dozens of other little everyday habits that you can't take away from any guy, war or no war. The daily routine may not be accomplished in the style to which they had become accustomed, but the boys seem to be making the best of a rugged situation.

On these two pages AIR FORCE presents a series of photographs portraying the personal side of life in North Africa for personnel of the Army Air Forces. Although they were taken by AAF combat camera crews before the last Axis retreater was brought to bay on Cap Bon Peninsula, these pictures are typical of scenes enacted almost daily by our flyers and ground crewmen in this vital war theatre. ☆

BARBER SHOP. Using his helmet as a basin, this sergeant ground crewman prepares for a North African shave.



20



SANTA CLAUS. Lieutenant Richard M. Wright, fighter pilot, gets a belated kick out of his Christmas presents which finally arrived in April.





INSPECTION. Nothing like broad daylight as an aid in seeking bugs in the blanket.



MUMBLETY-PEG. Enlisted men gather for the familiar pastime of tossing the jack-knife.

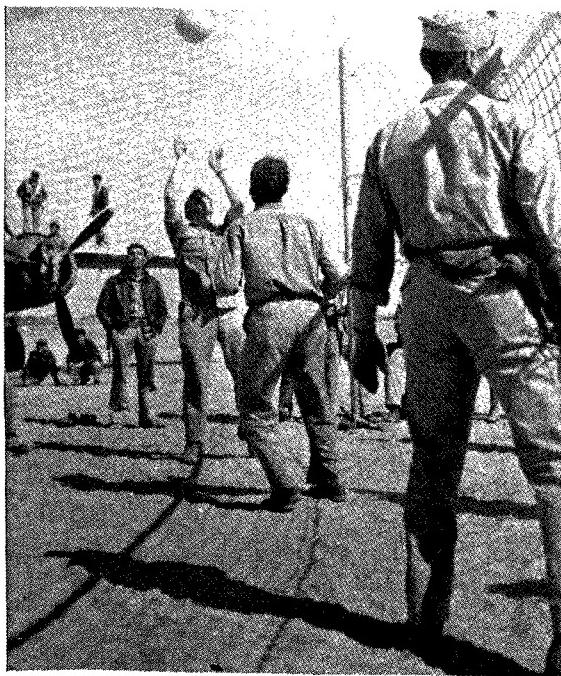


CHURCH. To the accompaniment of a portable organ, AF personnel at a forward airfield join in singing a hymn at Sunday services.

EXTRA STRIPE. This is never a chore for the men, but at home, you don't have seamstresses with handle-bar mustaches.



SNACK. Bomber crewmen smack their lips over doughnuts and coffee, awaiting another mission.



EXERCISE. Between missions, members of a bomber group relax at a game of volley ball.

SWEET DREAMS. Your best girl looks even better when you're operating away from home.

EXPLODING

THE

Jungle Myth

" . . . David Dauntless extricated himself from the twisted wreckage of his plane, only to stumble and grope into a green hell of tangled vines, teeming with insects. Unnamed terror gripped him as he faltered into the clutching net of a fearful spiderweb. Struggling to free himself, he sensed the new menace of a giant tarantula near his face. Overhead, he saw the cruel body of a boa constrictor uncoiling its lethal length. Somewhere in the bush, a jackal screamed. Cold sweat beaded on his brow as he lay helpless on the dark, steaming earth, awaiting a slow, tortured, certain death. . . ."

THESE might well be the words of back-room fiction writers who have never been near the jungle, or of publicity-seeking professional travellers who boost their stock by coloring the jungle with an aura of glamour and terror. Take the word of competent scientists and explorers with first-hand experience—it's strictly hokum!

Plenty of people, aside from the natives, have lived unromantically and without incident for years in jungle regions. Those who visit the jungle return with an almost unanimous conviction that it's a much more pleasant and safe place in which to live than most of our big cities.

The truth is that fear of the jungle, like most fears, is caused by an ignorance of the facts. This fear is largely the result of tall tales from unreliable sources. What are the jungle fears? There is the fear of animals—of snakes, crocodiles, spiders, wild beasts, bats and insects. Then there are fears of poisonous plants, of disease, of cannibals, of suffocating heat, of the impenetrability of the jungle "wall."

Let's look at the facts through the eyes of experienced naturalists and explorers who know the jungle intimately. Let's take up the "dangers," one by one, and "lay their ghosts." It is quite true that tropical jungle areas have a greater variety of animals than any other type of region but their aggregate number is relatively small. And contrary to popular notion, dangerous animals are rare and even these are timid in the presence of man.

Snakes, of course, are the number one jungle fear. The consensus among men who know is that the chances of being bitten by



a poisonous snake in any tropical region are actually smaller than in many parts of the United States where rattlesnakes or water moccasons are found. Many of the tropical islands are actually free of poisonous snakes, and even where they do exist, they're seldom seen. Normally, one may expect to see only one snake a month even when wandering through the jungle each day, and the chances are that this one will not be poisonous. Scientists who go out deliberately to catch snakes experience considerable difficulty in finding them. Some years ago, a large party of some seven hundred men travelled through a wide area of New Guinea and in a year's time, not a single member of the party was bitten by a snake. Pythons may be seen but they do not attack humans; no snake of the constrictor variety in the South Pacific islands is big enough to harm a man.

Some snakes in tropical jungles are poisonous, but they are easy to avoid and ordinary precautions are sufficient. Be especially careful when clearing ground for a camp site or trail, or when gathering firewood in the brush. Don't put your hand into dark crevices or behind rock ledges. Don't walk barefooted. You'll be given detailed instruction on suitable clothing to wear to protect yourself against snakes, along with a first aid kit for treatment in the exceedingly rare event of a bite. A last word on snakes: Visit your local zoo before you depart for the tropics and have a look at the only snakes you may see until you return home.

You've heard a lot about poisonous lizards in the tropics, but they're like ghosts,

often reported but never caught. The only poisonous lizard in the world is the Gila monster which lives in the southwestern United States. Large tropical lizards may look very fierce but they're actually quite harmless. If you come across a lizard when you're lost in the jungle, consider yourself lucky. It makes good eating. The smaller lizards you'll see scampering around in the forest or even in your tent are about as noxious as your maiden aunt's canary. Even if you deliberately make one bite you, its teeth aren't strong enough to pierce your skin. A mouse is a dangerous beast compared with the jungle lizard.

Man-eating crocodiles represent another much overrated danger. They're big, to be sure, but they have minute brains, very little initiative and certainly no courage. They rely for protection on their very tough hides rather than on their ferocity. As you approach them, they'll get out of your way. Only if you deliberately try to provoke or capture a crocodile will he put up a fight, and then the danger is more from the swift stroke of his strong tail than from his rather weak bite. A crocodile swallows its food whole and for this reason it won't attempt to attack any animal too large to swallow. To take on even a small man a crocodile would have to be more than fifteen feet long, a size rarely seen. Use reasonable caution; don't approach a crocodile too closely, and you'll have nothing to fear.

Now for the fable of the "dangerous wild animals." About the only carnivorous animals you'll find are in Africa; in Sumatra, Bali, Borneo and southeastern Asia there are tigers; the South Pacific has none. You'll

have to be a mighty good hunter even to see one of the big cats (outside a game reservation). Even if you should meet one, he'll make himself scarce. Large animals are dangerous if cornered or if you startle them suddenly, especially the females with young. But these are rare circumstances. Don't bother the big animals and they won't bother you.

But what of the other jungle "terrors"? What of the vampire bats, tarantulas, scorpions, leeches and army ants? Like the snakes, they're real enough, but they're much less fearsome than the Sunday supplement explorers would have you believe. One scientist deliberately exposed himself to the attack of vampire bats and was so little disturbed or frightened that he had considerable difficulty staying awake long enough to observe the results. It is true that their bite is painless, and that they can draw a small amount of your blood while you sleep. For that reason, if there are bats around use screens if you have them. But the bats won't leave you a bloodless corpse. The worst they may do is act as sleeping sickness carriers and this is rare.

Old wives' tales have it that the "tarantula" found sometimes on bananas from the tropics is capable of a bite that results in quick and certain death. Very large spiders, averaging two to three inches in diameter, are found in burrows in the ground, but

salt available, apply a pinch to the pest. A touch of a lighted cigarette or a swash of alcohol also will make it let go. Disinfect the site of the wound. When you have a companion handy, it's a good idea to strip daily to examine each other for the presence of leeches or ticks. Get them off before they have a chance to imbed themselves.

Army ants move about the jungle in long columns hunting for insects and other food. They are swarming killers who can devour anything *small* in their way that will not resist strongly. Unless you are helpless, absolutely the worst that can happen to you is a few stinging nips. If you get out of their way the army ants won't trail you through the brush like a pack of hunting dogs. And don't worry about being set upon and devoured in your sleep; you will be wide awake at the first bite and have plenty of time to move away.

Poisonous plants of the contact variety do exist in the jungle but none of them is as common or as virulent, as the abundant poison ivy and poison oak found in the United States. At the worst, you'll get a painful rash. You may happen on thorn-bushes and nettles, but once you get scratched you'll learn to recognize and avoid the offending growth. Watch the scratches. Disinfect them immediately if practicable. A secondary infection in the tropics is likely to be more serious than one at home. Learn

In many jungle and tropic areas, mosquitoes are thick and malaria is a serious problem, although the scourge is by no means universal. If you find yourself in a mosquito area, sleep under your net and take quinine or atabrine at the direction of your medical officer. Be especially cautious at night when mosquitoes are at their biting worst. Keep your face and head covered and if you have them, wear mosquito boots and gloves. Don't scratch mosquito bites. Malaria may be an uncomfortable ailment but with modern treatment and medicines, there's not much to fear from it.

Dysentery and cholera are intestinal diseases which you put into your own mouth. If you're careful about sanitation and the cleanliness of the food and water you consume, chances are you won't get them. Unless you are lost and starving, eat only food coming from cans or freshly cooked in your own mess, or fruit (thick-skinned) that you have peeled yourself. Watch the water you drink. Mountain streams distant from human habitation are safe. However, unless you know that there isn't a native hut a mile or two upstream, always boil the water you drink or sterilize it with chemicals.

News on tropical climate frequently has been distorted. The weather is warmer as a whole on a yearly basis than in the temperate zone to which you're accustomed, but actually the temperatures are not excessively high. The heat is simply more persistent and continuous, and in humid areas it may be somewhat uncomfortable. Yet, seasoned jungle travellers tell us that they have found Washington, D. C., in the summer much more oppressive than any jungle they've ever visited. Chilly nights are not uncommon in the tropics.

Now a word about the native "terrors." Cannibals and headhunters are a thing of the past. You may find natives hostile to small parties in the interior of Dutch New Guinea and in the Admiralty Islands. But for the most part, primitive jungle tribes have come under the influence of missionaries practically everywhere. The best evidence is represented by the invaluable assistance given our flyers who have been forced down in jungle areas. Most natives know they will be rewarded for the aid they render. Just remember to respect native customs; try to conform to their manners, or at least be tolerant of them. Let their women alone. It's a good idea to find out something about the natives in the area in which you will operate. A little understanding of their habits and language may help save your life some day.

While the tropical jungle will be very different from your home environment, the same principles of precaution apply. You soon learn how to live in the tropics but it's best to go there with foreknowledge. Take all the "terror" stories you've heard with a grain of salt. Knowledge and common sense will see you through. ☆

(Additional reading on this subject: "Jungle and Desert Emergencies," distributed by the Flight Control Command. -Ed.)

they quickly retreat into their hideouts when you approach. Centipedes, scorpions, tarantulas and spiders may bite you. Generally, the worst you can experience is severe pain and some swelling, which will disappear in a few hours. The bite of certain large spiders in Australia may prove fatal but the spiders of America and Africa with one exception are not dangerous to a normal individual. The one exception is the notorious "black widow," a rather small and harmless-looking black spider with a red hour-glass figure on her underside. This spider has caused a few deaths, and, believe it or not, in the very healthy climate of California rather than in the "dangerous" tropics. You can take some simple precautions against spiders and tarantulas that should protect you. Before you lie down at night, look over your bedding carefully. Before you put your shoes on, shake them out; they're a favorite resting place for scorpions.

Leeches are common in the tropics in wet or swampy places and are often a nuisance. Their bite is harmless but the small wound they make may become infected and cause a sore. It is well to wear leggings or to tie the trouser legs snugly to protect yourself in areas where leeches are present. If a leech does attach itself to your skin, it is easy to remove. Don't tear it off, because the head may remain imbedded in your skin. Flick the leech off with a knife or if you have

the technique of moving about in jungle growth. A slow, deliberate, snake-like movement is best. Blundering forward only leads to bangs on the head and thorn scratches under the chin. You'll go faster if you watch your step. Keep your head forward with your chin in. Part the jungle; don't try to push through it.

Your first night in the open or in a tent in the jungle may give you the "heebie-jeebies." The forest is alive with sound, with all manner of howls, shrieks, screams and eerie echoings. There some birds rattle out a machine-gun tattoo on tree trunks. The magnificent peacock makes a horrible noise. Monkeys may howl or roar like lions. Dead trees may fall and snap like pistol shots. Don't get the idea you're going to be jumped and mauled. Animals looking for food don't advertise. The loudest and most terrifying noises are made by harmless birds and monkeys. A cat fight on your back fence at home doesn't scare you. Get used to jungle sounds at night; they have about the same significance.

Now what about tropical diseases? The average fighting man imagines himself coming back from the tropics shivering with fevers, rotting with parasites and suffering from the ravages of dysentery and cholera. The truth is that a man can stay reasonably healthy in the tropics provided he observes a few simple precautions.

HE'S REALLY QUITE A MAN!

(Continued from Page 9)

northern Canada and he was there with his passengers for 39 days before the weather permitted rescue crews to get them out. For a month this pilot, his crew and his passengers had been supplied with food supplies by parachute. Equipment was dropped which permitted them to cut out a runway on the ice of the frozen lake. After their rescue, crews went in and flew the forced down C-87 off the ice.

Both the pilot and plane are still in the North Atlantic service, each of them graphic examples of the closely meshed coordination between the civilian and military personnel of the Air Transport Command.

If you've ever flown one of the commercial luxury airliners you'll remember up above the instrument panel where they had the cigarette lighter, just like the one on the dashboard of your car. Down over the South Atlantic recently one of these old airline pilots absent-mindedly reached up above his head for the lighter. Before he could drop the cigarette from his mouth the right motor conked out on him. He had forgotten that on ships being delivered to the Army such luxury items as cigarette lighters are non-essential. Where the lighter used to be is the control for feathering the props.

Little incidents like that keep them on their toes.

They have no guns on their planes even though they are often flying through skies patrolled by enemy planes.

"Yeah, we think about it some," one vet-

eran million-miler told me. "Hell, we even got it planned to stick broom handles out through the cargo doors to make 'em think we got machine guns if we ever get jumped. Maybe it'll scare 'em off."

As a matter of fact the only armament they carry is a forty-five for their life raft and a Very signal pistol. Not much use against cannons or lead-spitting fifties. But the Air Transport Command will tell you that their job is to deliver the goods and armament weight reduces precious pay load.

Sometimes their cargo is as dangerous as enemy planes in the sky. One pilot tells the story of carrying a load of 6,000 pounds of short fuse detonators, which is just about as dangerous as coming home to your bride of three weeks and telling her you dropped the family bankroll in a friendly game of poker.

"We showed up at this base," he says, "and the dispatcher tells me there are three Generals waiting to hitch a ride on to the next stop. 'You aren't afraid to fly so much brass in one load, are you?' he asked me.

"I think a hell of a lot more of my own skin than that of any General and I'm riding with it," was my answer."

However, the Generals failed to arrive in time for the scheduled departure so an Army chaplain, evidently having already made his peace upstairs, climbed in for the ride and slept peacefully the whole trip atop the detonators.

Overseas, however, isn't the only place you will have a chance to become acquainted with the new ATC uniform. They are approved for airline personnel in the vast transition transport training program and domestic cargo operation of the Air Transport Command. At Army Training Detachment fields these airline veterans are conducting the training program under the Army-approved curriculum prepared by the Airlines War Training Institute. On the regular cargo runs each veteran pilot will have two Army Air Forces trainees under his guidance, teaching them the important "know how" of transport flying. The gray matter and experience in transport technique tucked in between the ears of these air contract carrier personnel and now being conveyed to Army trainees is one of the most important con-

tributions of this country's airlines to the war effort.

The importance of this domestic air cargo operation cannot be over-emphasized.

It is a system that permits air cargo planes to operate schedules between the factories turning out vital parts and the modification centers, training units and air depots.

Frequently a plane is finished at the factory needing only one small part before it is operational. The part may be produced in a plant that is across the country. If parts of this kind can be picked up today by plane, delivered to the manufacturer and installed on the waiting plane, it may be flown to its destination with a minimum of delay. It may save five days in the time required to get an airplane into action. Adding these savings together often totals a month. A month saved getting a plane into combat may mean the difference between victory or defeat.

These pilots work hard, averaging 100 hours a month in flying, making daily trips of eight to twelve hours duration. On a round trip from a base in the United States and return they'll maybe be gone from a week to ten days, putting in a total of 35 or 40 hours of actual flying time in that period and covering up to 12,000 miles.

Submarines are a big worry to them, not only because of the danger U-boats represent but because it makes their blood boil when a German sub crew down in the South Atlantic mans the guns on the deck and waves for them to come on in and fight.

"And us without even a brick to drop on them," they moan.

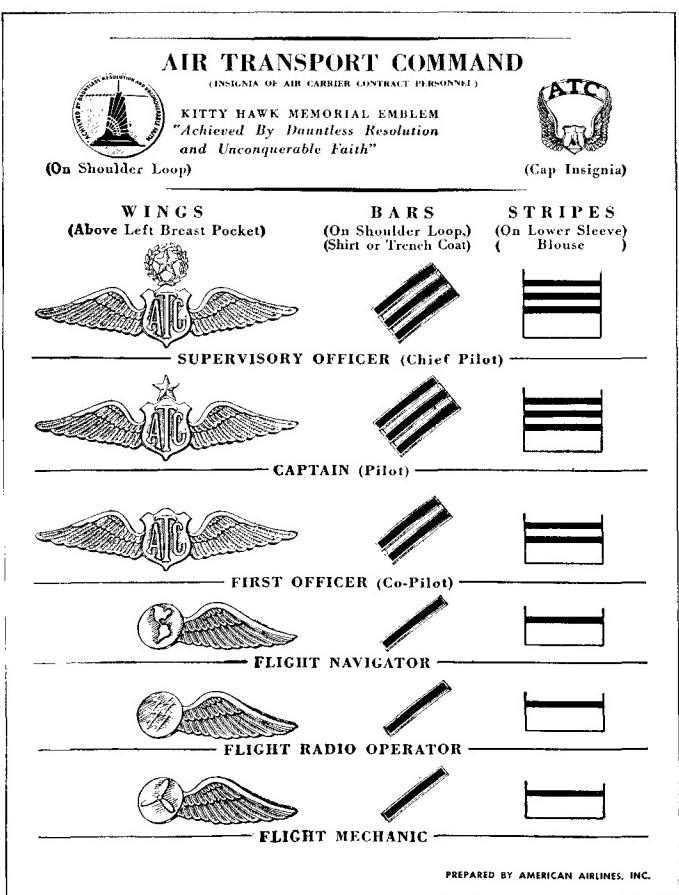
But submarine scares furnish many a laugh, too, on cold icy nights at lonely bases across the North Atlantic route, as they sit around waiting for the weather to clear. They tell and retell the story of the crew flying a C-87 up an Arctic fjord last winter, under a heavy overcast, when they spotted what they thought to be two submarines firing tracers from their bow deck guns. They got out of there in a hurry only to find out later that their "submarines firing tracers" were a couple of whales spouting water.

They've had German aircraft chase them in the skies off England and icy runways crack them up in the Arctic. They have sweated in temperatures as high as 105 degrees and a few hours later been in the midst of a raging blizzard.

"Why we don't all die of pneumonia, I'll never know," more than one marvels.

So the next time you see an Air Carrier Contract man wearing the "ATC" insignia look at him with respect. Maybe he's forgotten more about flying than you'll ever know. And remember that fighting a war isn't all ribbons and fast pursuits and sorties with tons of bombs over the enemy. Remember that it takes supplies and men and vital materials to carry out these missions and they are needed in a hurry. It is the Air Transport Command's job to see that they are delivered there when they are needed. And this man is doing his part to see that they arrive on schedule.

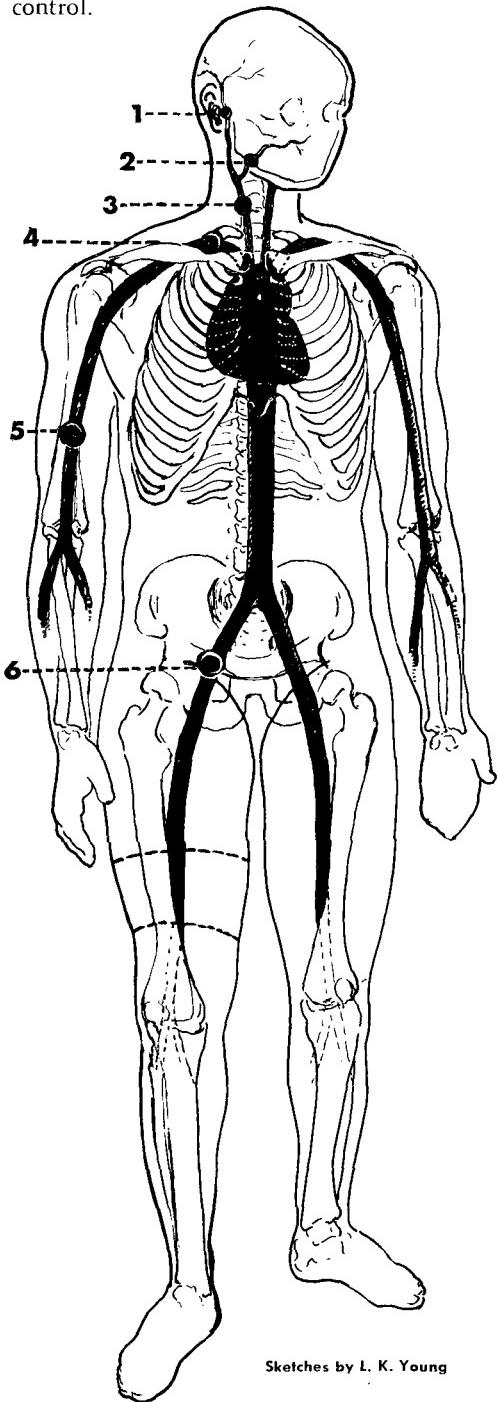
He's really quite a man! ☆



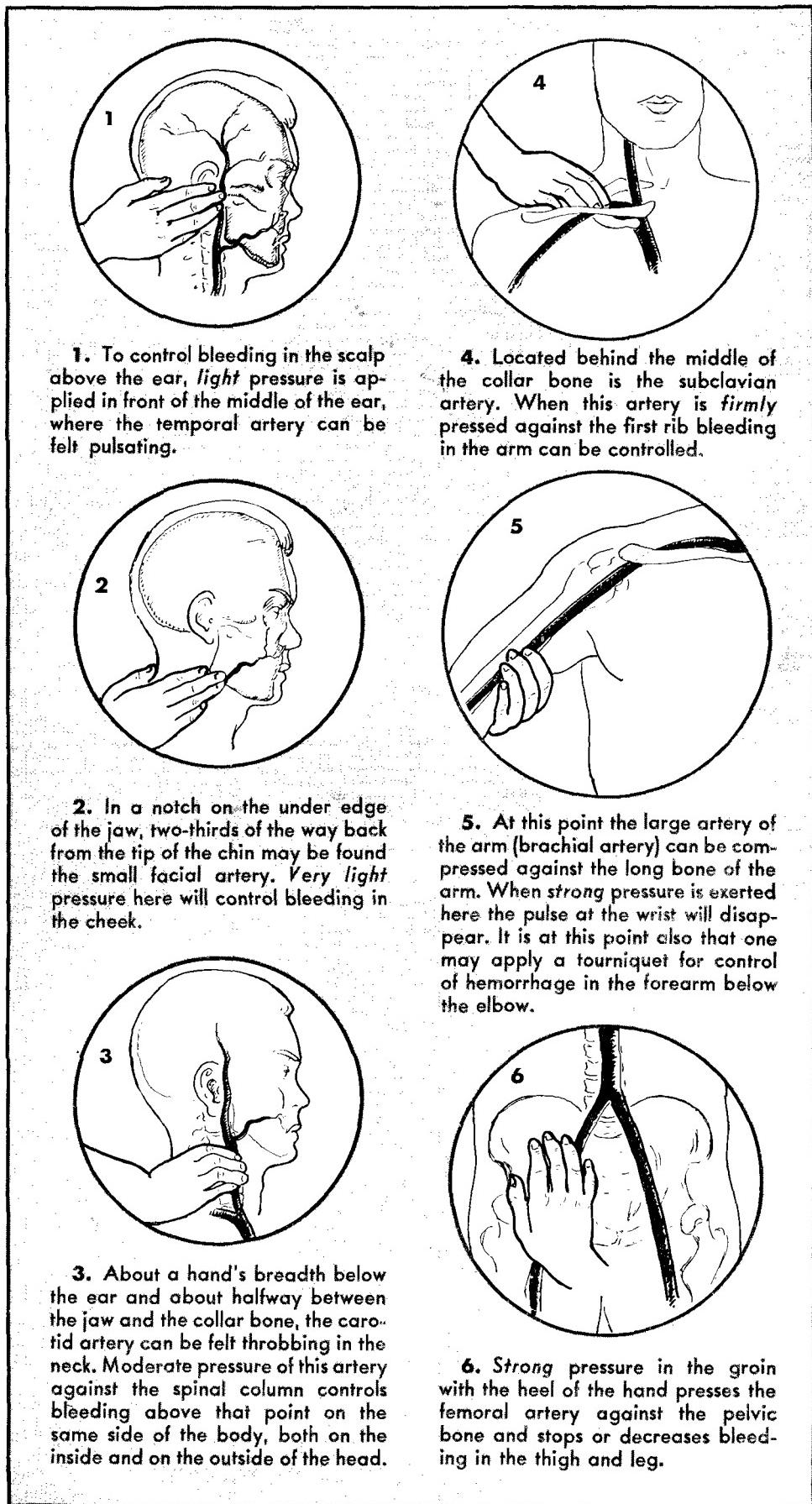
SAVING LIVES WITH YOUR FINGERTIPS

IN THIS and other wars, untold hundreds of lives have been lost due to excessive and uncontrolled flow of blood from wounds received in battle. Bombers have returned from missions with bodies of crew members who bled to death. In many cases, the simple knowledge of first aid pressure points on the part of a companion might well have saved a life.

The accompanying diagrams illustrate these pressure points for the control of hemorrhage. On the full figure are pointed out the locations of these vital arteries, while the close-ups show the proper placing of the fingertips to accomplish pressure control.



Sketches by L. K. Young



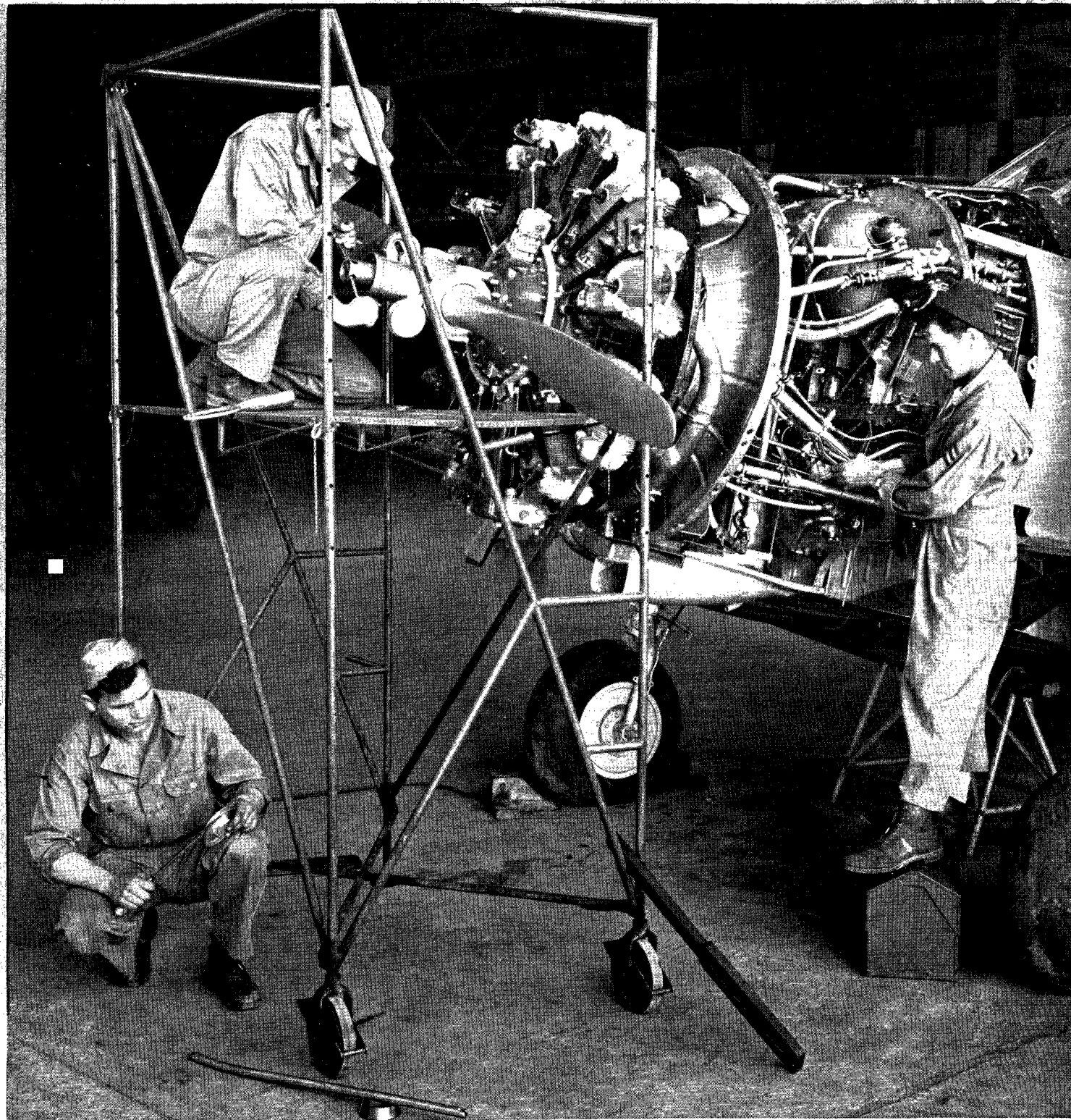
3. About a hand's breadth below the ear and about halfway between the jaw and the collar bone, the carotid artery can be felt throbbing in the neck. Moderate pressure of this artery against the spinal column controls bleeding above that point on the same side of the body, both on the inside and on the outside of the head.

4. Located behind the middle of the collar bone is the subclavian artery. When this artery is firmly pressed against the first rib bleeding in the arm can be controlled.

2. In a notch on the under edge of the jaw, two-thirds of the way back from the tip of the chin may be found the small facial artery. Very light pressure here will control bleeding in the cheek.

5. At this point the large artery of the arm (brachial artery) can be compressed against the long bone of the arm. When strong pressure is exerted here the pulse at the wrist will disappear. It is at this point also that one may apply a tourniquet for control of hemorrhage in the forearm below the elbow.

6. Strong pressure in the groin with the heel of the hand presses the femoral artery against the pelvic bone and stops or decreases bleeding in the thigh and leg.



WHAT'S WRONG WITH THIS PICTURE?

Daisies won't tell—but T.O.s will.

This page will give you some laughs but it isn't meant to be merely humorous. The real idea is to depict some everyday maintenance boners. Some of the mistakes that look funny in the picture aren't quite so laughable when they happen in the hangar. You'll find those mistakes listed on Page 32. Technical Sergeant

John R. Hicks, crew chief in the photograph, can point out eleven errors. Did he miss any? How about it, mechs?

The picture this month for our regular feature "ON THE LINE" was posed by Technical Sergeant Hicks, on the stand; Private First Class Leonard Gallas, left, and Sergeant Gene Wefler, all stationed with the 18th Headquarters Squadron, Air Service Command, Patterson Field, Ohio.

AIR FORCE, July, 1943

ON THE LINE

A monthly maintenance roundup prepared in collaboration with the Air Service Command and the Technical Inspection Division, Office of the Air Inspector.

DID YOU KNOW . . .

That salt tablets and water for mechanics are plentifully supplied in all hangars and shops? Don't wait until the heat gets you. Take these salt tablets and drink plenty of water to replace the salt and water your body loses in excessive perspiration.

Radial engines do not require water, but a human engine does. Service your own cooling system regularly. Camels can drink ten or twelve gallons of water at a time, store up a water supply. Human beings can't. Their water intake must be at frequent intervals to avoid dehydration. There's your cue.

Ventilation is important in combatting the ill effects of heat. Look around and see that windows and doors are kept open. Get all possible circulation of air when temperatures are torrid.

Take salt tablets before you need them, not when it's too late.

Cool off a little before gulping cold liquids. Keep windows and doors open for best ventilation possible.

Such simple heat precautions may prevent your incapacitation. Stay off the sick list for your own comfort, and to fill the vital need for your work.

STRANGE AS IT SEEMS

At a midwestern field, eight airplanes were found to have either one or two wheel retaining nuts safetied with common nails. Cotter pins should be used, as indicated in T.O.'s -03-25 series.

TWISTED CABLES . . .

Rudder trim tab cables, particularly on single-engine trainers, occasionally get twisted inside the rudder during installation. This condition is often overlooked during subsequent inspections. These twists will break the strands, thus weakening trim tab cables, and endanger steering apparatus. Watch for this at the next inspection. Take a look at T.O. 01-1-26.

IMPORTANCE OF CRATING . . .

Sloppy crating of Army Air Forces equipment for shipping will inevitably result in damage en route. Frequent example of carelessness: improper or inadequate crating. Crates should be made plenty strong, as prescribed in T.O. 01-1-31.

Engines, in particular, have not been given sufficient care in crating. For the right way to do it, see T.O. 02-1-1, paragraph 4. Bust our stuff over Tojo's head, not in some railroad boxcar.

COTTER PIN . . .

Keep the old eye on each cotter pin installed in landing wheel retaining nuts. If the pin is not bent and cut off as directed, the end will rub against the dust cap. This will cut off filings, which work their way into the bearings and inflict damage there.

See T.O.'s of 03-25 series. These pertain to landing gear.

DEFLATING STRUTS . . .

Damage to a valve core causes air leak and possible disaster to the airplane while landing with a deflated strut. This trouble is often traced to air-oil shock absorber struts being deflated by depressing the valve core. T.O. 03-25E-1 specifies that the strut is to be deflated by backing off filler plug slightly. Lightly and politely, mechs.

ENGINE HOISTS . . .

Remember that the type A-2 engine hoist assembly must *not* be used without the crossbar attached. Minus the crossbar, the legs might spread, dropping the engine to the floor. Think of what this does to the engine, or you, if you're underneath when it falls.

HERE COMES THE SANDMAN . . .

Sand and other impurities often are found in gas strainers. T.O. 06-1-1 gives instructions for cleaning gas servicing nozzle screens. If not cleaned regularly, dirt gets into the aircraft fueling system. A sorry situation if that dirt stops the engine while in flight.

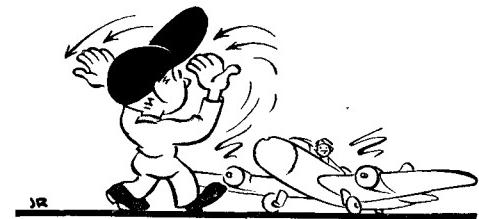
CARBURETOR AIR CLEANERS . . .

Many an airplane engine's life has been cut short in early youth because carburetor air cleaners were not cleaned and oiled daily. This daily requirement is set forth in T.O. 01-1-23. Our engines must live to a healthy, ripe old age.

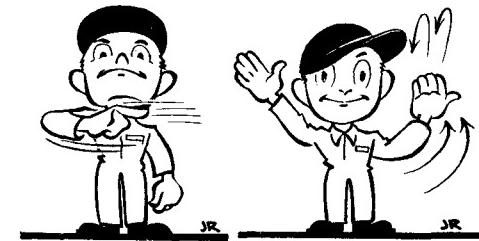
IS THIS NEWS TO YOU?

That there is now a standard system covering the use of hand signals to guide the operation and movement of all aircraft on the ground? Every mech should learn and use the signals officially adopted by the AAF to direct taxiing airplanes. It's the real way to insure a high degree of safety.

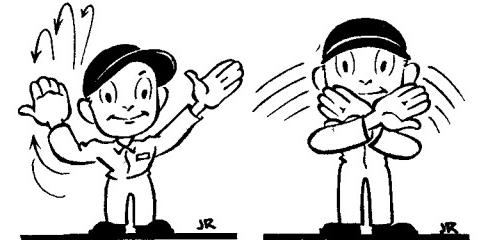
Illustrated on this page are the five signals needed most frequently. The drawings give the correct signals. Refer to Schedule A of AAF Regulation 62-10 which gives the complete setup on the new standard hand signals.



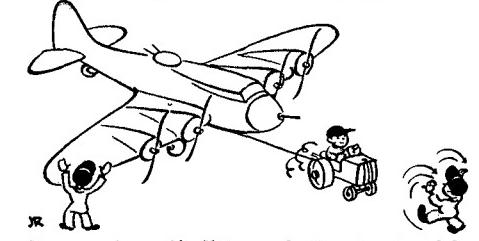
Go Forward
(Stand where pilot can see you)



Parking Completed Turn Left



Turn Right Stop



Man on Foot Shall Precede Towing Vehicle

BRIEFING For the South Atlantic Run

By CAPTAIN T. W. FINNIE

GROUP S-2, MORRISON FIELD

COMBAT crews headed for the battle-fronts by way of the South Atlantic route are processed through Morrison Field, Florida.

This station is responsible for seeing that all departing planes are properly equipped and prepared for the flight overseas and, moreover, that they are manned by crews provided with adequate training and information. Officers and men of such crews go through our S-1, S-2, S-3 and S-4 sections for the final check-up.

Not the least of these responsibilities is that of the briefing unit. It is the duty of the briefing unit:

1. To insure that all crew personnel are properly equipped for the flight, including the issuing of route data, maps, navigational equipment, secret codes and other necessary material.
2. To insure that all flight personnel of departing aircraft are familiar with the facilities and conditions of the route.

It is upon information supplied by this section that a crew largely depends in meeting its initial challenge—to get over that water.

Briefing for trans-oceanic flights, as now practiced in the Army Air Forces, really began at Morrison Field.



More than a year ago the field was established as an Air Transport Command base and since that time a vast store of flight information has been collected. So extensive is this data that, if necessary, a crew could probably be briefed for a trip not merely across the South Atlantic but to any part of the eastern world.

Route information concerning weather, radio beacons, location and procedure of airfields, and other conditions affecting flight is maintained in complete and compact form. This data is kept up to date and expanded by reports from returning pilots. The briefing section has a wide variety of United States, British and French aeronautical, engineering and hydrographic charts. A map and chart room, perhaps the most extensive library on the South Atlantic route, has shelf after shelf of both the long range and pilotage type maps. Some are special maps and projections developed by

navigators sent out from the station itself on trail-blazing missions.

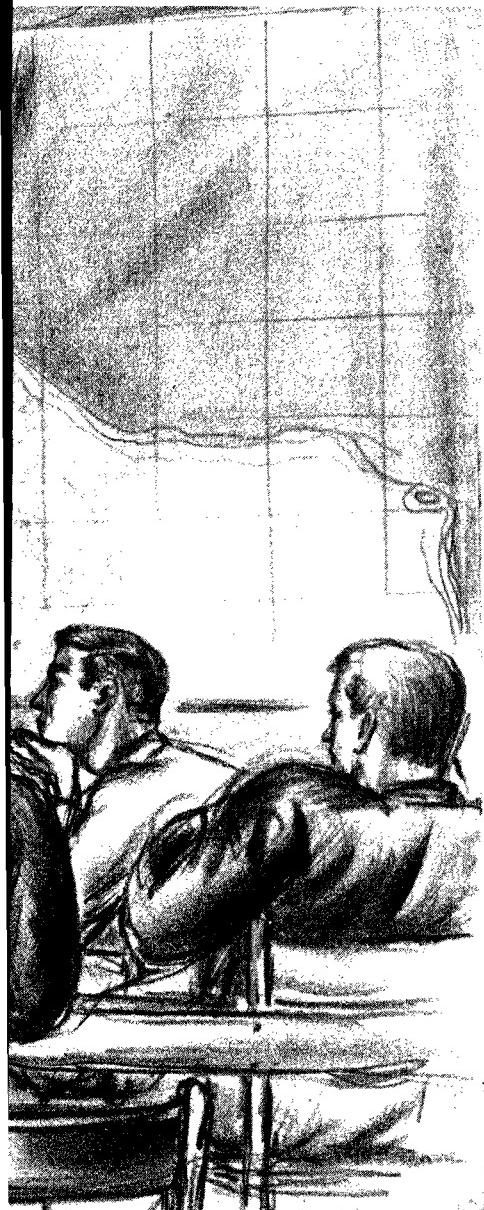
Supplementing all this information are photo displays with pictures of main and auxiliary fields, runways, living quarters, repair and overhaul facilities, and the like.

IN a word, briefing at Morrison is comprehensive, visual, and up-to-the-minute designed to give a pilot a rounded picture of any area to which he may be going.

The actual briefing of pilots and navigator of a combat crew takes very little time—approximately 45 minutes. This time, of course, varies with the experience of the crews being briefed. Those familiar with the South Atlantic flight can be briefed in fifteen minutes, receiving only changes and late information since the crew's last trip.

When a crew first arrives at Morrison Field it reports to group operations for processing. Briefing is scheduled for three definite periods each day, but it is actually available day or night, at the request of a plane commander or flight commander.

ILLUSTRATED BY
CAPTAIN RAYMOND CREEKMORE



Combat crews are well prepared for their first big over-water flight

Briefing appointments are made at least 24 hours before take-off. Last minute instruction is not satisfactory because it adds to the mental confusion of a crew necessarily engrossed with other details of departure. The purposes of advance briefing are:

1. To discuss with pilot and crew the route folder, which has its maximum value when studied at leisure.
2. To give pilot, co-pilot and navigator an opportunity to read the latest information about the route, and to examine reports of returning crews.
3. To allow time for pilot and crew to question experienced personnel at the station, on matters pertaining to oceanic flying.
4. To allow the navigator enough time to calibrate his instruments and prepare his maps.

5. To allow time for study of photographs and all related data except weather information which, of course, is imparted just before take-off.

Briefing takes place in a large room which has a relief map of the Caribbean Area, fifteen by eighteen feet, to illustrate verbal information.

Normal briefing includes a discussion of visual signs for identification purposes, communication identification codes, Rekoh cards, and an explanation of the weather folder which the pilot receives from the weather officer.

Explanation of the pilot's folder comes next. This is prepared by the briefing office and contains the latest route information obtainable from all accurate sources. Crew members always have an opportunity to read over this folder before a briefing and are ready to ask pertinent questions.

The folders are arranged very logically. Like the data used by commercial airlines, the regular route and regular stops are separated from the alternate route and alternate stops or emergency fields. This technique permits the pilot to have a small, compact folder for the regular route he anticipates flying.

FOR use in an emergency, the pilot will still have additional information about the nearest alternate airport and a route to it.

Since it is obvious that the value of the information furnished by pilots passing through Morrison Field is the speed with which it is made available to other crews, a new directive permits the use of certain data in these pilots' folders without waiting clearance from Headquarters in Washington.

Folders are arranged geographically so they can be followed progressively along the route to be flown.

They include descriptions of fields, radio stations and frequencies, of housing and messing facilities, and of prominent geographical landmarks which can aid in navigation. All this material is illustrated by photos. The weather folder, given immediately before departure, contains a weather map of the pertinent area, a cross-section diagram of conditions forecast over the route, a flight plan, and the weather codes.

During the briefing, the briefing officer discusses individual airports and the procedure for entry through corridors to avoid restricted areas. Radio facilities along the route are thoroughly analyzed for their navigation value. Crew personnel are invited to ask questions relative to any of this information.

The general climatic conditions to be expected are discussed by officers who have covered the route, and suggestions are made concerning elevations, let-down procedures, and methods of avoiding turbulence and storms. The crew receives a detailed weather briefing one hour before departure.

Briefing covers the Caribbean Area and the South Atlantic as far as the first stop in the South Atlantic Wing. This is done for several reasons, principally because the first

long flight to South America is frequently a "shakedown flight."

New crews are inclined to be worried about the long over-water hop. Confidence can be inspired by a complete discussion of the entire route within the Wing by officers personally familiar with it. Each station within the Wing supplements the overall briefing with a detailed briefing of the next leg of the flight anticipated by the crew.

A new crew, therefore, receives at Morrison a highly specific briefing on the first leg, a specific written instruction for the entire trip, and a verbal treatment of the overall route within the Wing.

No night flights are permitted without a navigator. After the briefing, the navigator of a crew is taken aside by an experienced navigator who explains in great detail the problems of long-range aerial navigation of the South Atlantic. Each navigator must satisfy the briefing navigator that he is properly equipped and capable of making the flight. All essential equipment for his work is available at the field. He has, moreover, a locker to store his equipment and broad desks upon which to facilitate the handling of his maps and charts.

Radio operators are likewise given special attention after the main briefing. They are briefed in detail by radio operators who are well experienced in communications and procedure along the route.

To all members of the crew much stress is laid upon the necessity for maintaining military security. The briefing officer discusses the possibilities and procedures in case of capture, escape and parole in enemy territory, and the destruction of classified material. Instructions concerning IFF and VHF equipment and its destruction is included.

Emphasis is placed on the current position of enemy and friendly troops and air forces, so that the crewmen will be oriented when they set out.

Maps extending as far as Cairo and the Middle East are provided at Morrison. These maps cover all four of the methods of navigation—pilotage, dead reckoning, celestial and radio. It has been found that all four methods may have to be utilized.

With folders, reports from returning crews, photographs and various other kinds of data, every member of a crew has a mass of material on hand at Morrison with which to inform himself for the South Atlantic flight. This written information is supplemented by personal advice from briefing officers, who are always available.

It is not expected that either a pilot or a navigator will memorize all the details of what he has been told, for they are voluminous. But every effort and facility is provided to help him know his business thoroughly. The procedures, material and methods used in briefing at Morrison Field have been the result of much experience. When a crew leaves the field it should not only know how to get where it's going—it should be ready in every way for foreign duty. ☆



A monthly record of decorations awarded to personnel of the Army Air Forces.

Capt. E. H. Nigro



Lt. A. W. Lowry

DISTINGUISHED SERVICE CROSS

BRIGADIER GENERAL: Howard K. Ramey (Also Distinguished Service Medal). **CAPTAIN:** David A. Campbell. **LIEUTENANT COLONEL:** George B. Greene, Jr. **LIEUTENANT:** Edward D. Durand.

DISTINGUISHED SERVICE MEDAL

MAJOR: Lewin Bennett Barringer.

SILVER STAR

COLONELS: William W. Momyer (With Oak Leaf Cluster, Also Distinguished Flying Cross and Air Medal with three Oak Leaf Clusters), Edward Timberlake, James H. Wallace, Stanley T. Wray. **LIEUTENANT COLONELS:** Charles E. Mario, Claude E. Putnam, Jr. **MAJORS:** Raymond S. Morse, Walter B. Putnam, Henry N. Sachs, Allan J. Sewart, Jr.* (Also Distinguished Flying Cross* and Air Medal*). **CAPTAINS:** Glenn W. Clark, Edwin A. Loberg (With Oak Leaf Cluster, Also Distinguished Flying Cross), Raymond P. Salazarulo*, Roman T. Schumacher, Leo F. Wolcott, Jr., Boris M. Zubko. **LIEUTENANTS:** George F. Callahan, Jack I. B. Donaldson (With Oak Leaf Cluster), Bruce A. Gibson, Jr., Rush V. Greenslade, Thomas L. Hayes, Jr., Kermit C. Hynds, John W. Kidd, Edward J. Magee, Mortie M. Marks, Ralph G. Martin, Kermit E. Meyers, Richard E. Miller* (Also Purple Heart*), James B. Morehead, Marne Noelke, Glenn C. Osbourne, George A. Parker, John C. Price, Gustave R. Rau, Robert H. Richards, Daniel T. Roberts, Charles E. Rogers, Mabry Simmons, Luther P. Smith, Jr., Lloyd H. Stinson, Charles P. Sullivan, Joe Walker, Dugan V. Woodring. **MASTER SERGEANT:** Franz Moeller*. **TECHNICAL SERGEANT:** Clarence E. Daugherty, Thaddeus S. May, Claude B. Phillips, Cal Russell, Robert Starevich (Also Distinguished Flying Cross and Air Medal), James H. Turk. **STAFF SERGEANT:** Richard T. Brown, Harold J.

* Posthumous

Leamster, Hubert M. Stratton, D. C. Stuart, Arthur Webber, Leslie D. Willard (Also Distinguished Flying Cross). **SERGEANTS:** Ronald J. Allsop, Karl E. Binder (Also Distinguished Flying Cross and Air Medal), Joe G. Maupin, Charles Petrakos, Leo T. Ranta, George D. Scheid*, Aaron B. Shank*, Thomas W. Smith, John J. Stephenson. **CORPORALS:** William R. Holmes, John W. Kinnane, Hyman Marder, Leo E. Shreve (Also Purple Heart), Robert P. Swan (Also Purple Heart), William J. Wagner*, Charles H. Young.

PURPLE HEART

COLONELS: Harry G. Montgomery, Wilfred J. Paul, Augustine F. Shea. **MAJORS:** Victor C. Huffsmith, Carey L. O'Bryan (Also Air Medal), Marvin E. Walseth. **CAPTAINS:** Gilbert E. Erb (Also Distinguished Flying Cross with Oak Leaf Cluster and Air Medal), Howard R. Fellenz, Andrew J. Reynolds, Donald R. Strother* (Also Air Medal*). **LIEUTENANTS:** Barnett S. Allen, Garde B. Baldwin, Edwin M. Boughton (Also Air Medal with three Oak Leaf Clusters), Everett L. Clinard, David M. Conley, Herbert V. Dow, Robert Paul Dresp, James H. Foster, Delbert H. Hall, Edwin P. Heald, Cleveland D. Hickman, John T. Hylton, Jr., Oscar R. Krebs, Allan W. Lowry, Clarence E. McClaran, Mac M. McMarrell, William R. Maloney, Robert H. Markley*, Louis G. Moslener, Romulus A. Picciotti, Harvey E. Rehrer, Jacob C. Shively, Frederic E. Whitaker. **MASTER SERGEANT:** Warren B. Caywood. **TECHNICAL SERGEANTS:** Anthony L. Buckley, Edward J. Cashman*, Harry D. Donahay, Lloyd C. Martin, Clarence A. Witmer. **STAFF SERGEANTS:** Rupert W. Arnold, William A. Bellwood, Edwin A. Bettencourt, George P. Bolan, Maurice P. Cotter, Edward C. Graboski, Elwood R. Gummerson, Wilson A. S. Howes, Maurice W. Knutson, Harold F. Lightbown (Also Distinguished Flying Cross with Oak Leaf Cluster and

Lt. R. L. Hartzell

Capt. R. T. Schumach

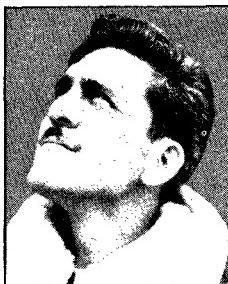
ROLL OF HONOR



Capt. A. J. Kush



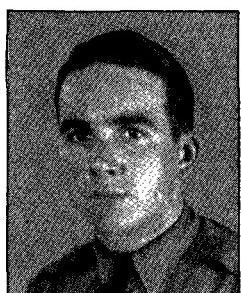
Lt. R. H. Dennis



Sgt. Alfred A. Ise



Capt. G. W. Clark



Lt. A. E. Aenchbacker



Capt. Denver Truelove



Lt. R. P. Dresp



Capt. C. H. Hillhouse



Lt. Col. L. I. Davis



Major W. B. Putnam



Col. J. H. Wallace



Sgt. H. F. Lightbown

Air Medal), Sheldon D. Nearing, Everett F. Perkins (Also Oak Leaf Cluster to Silver Star), Andrew Seman, Paul J. Smith, Earl E. Teats, Charles D. Wright. **SERGEANTS:** Wilbert R. Burns, Francis D. Crossman, Samuel H. DeBerry, Robert C Dewey, William Hislop*, Edmund B. Lepper*, George M. Martin, Jr.*, Edwin N. Mitchell*, Robert J. Nichols, Richard K. Ramm, Roslyn C. Richardson. **TECHNICIAN FOURTH GRADE:** James L. Schiller. **CORPORALS:** Edward Finn, Roberto Gonzales, Emmett E. Morris*, Hoyt A. Pollard, Antonio S. Tafoya*, James M. Topalian*. **TECHNICIAN FIFTH GRADE:** Martin J. Zimmermann. **PRIVATE FIRST CLASS:** Louis H. Dasenbrock*, James E. Gossard, Jr.*, William E. Hasenfuss, Jr., Carl E. Lanam, William E. McAbee*, Harrell K. Mattox*, Alfred Osborn, Sidney E. Wroton. **PRIVATE:** Garland C. Anderson*, William F. Blakley, Robert S. Brown*, Willard Fairchild, Russell E. Gallagher*, Robert R. Garrett*, Glenn V. Greenfield, John J. Horan, Walter J. Hughes, James R. Johnson, Robert H. Johnson*, Donald Y. Kemmerer, Marion E. King, Jr.*, Herbert E. McLaughlin*, Charles Mesrobian, Victor L. Meyers*, George A. Moran*, Robert S. Waugh, Theodore A. Wenzel.

DISTINGUISHED FLYING CROSS

BRIGADIER GENERAL: William E. Lynd (Also Air Medal). **COLONELS:** Thomas O. Hardin, Ernest K. Warburton. **MAJORS:** John A. Roberts, Jr., Raymond F. Rudell, Francis A. Smith. **CAPTAINS:** Charles H. Bowman, Vincent M. Crane (Also Air Medal), Charles H. Hillhouse (With Oak Leaf Cluster), Clyde B. Kelsay (With Oak Leaf Cluster), Ira F. Wintermute. **LIEUTENANTS:** George W. Beaver, John E. Bloomhuff, Robert E. Carlson, Charles M. Carter, Leo M. Eminger, David C. Everitt, Jr., Richard H. Dennis, Dan D. Drakulich, Rush E. McDonald, Clarence L. Marthey, William R. Morhouse, Richard W. Nellis*, Jack Pebworth, Arthur J. Platt, R. V. Prouty, Michael L. Reitman, Francis L. Schneiders, John W. Sears, Robert L. Stevens, James C. Watson, Frederick G. Wheeler (Also Air Medal with Oak Leaf Cluster), John L. Wolford. **FLIGHT OFFICER:** Burl S. Ashley (Also Air Medal). **MASTER SERGEANT:** Russell E. Mackey. **TECHNICAL SERGEANT:** Louis Burleson (With Oak Leaf Cluster). **STAFF SERGEANTS:** Ralph W. Barnes, J. W. Childers, David C. Culver, Lawrence E. Donald, John J. Gerrity, James E. Houchins*, James M. Iverson*, P. J. Leonard, Joseph W. McWilliams, John R. Meeks, Jr., Peter F. Novak, Robert K. Stone, Jr., John F. Szymonik, Thomas G. Thompson, David C. Vaughter, Wilbur H. Weedin. **SERGEANTS:** Joseph J. Brust, Victor A. Edwards, Charles D. Hudson, Wayne E. Johnson, Donald J. Kundinger, Doyt T. Larimore, Howard S. Peterson (With Oak Leaf Cluster), Walter E. Shay. **CORPORALS:** Bruce W. Osborne, Robert G. Thomas, Alexander Zaretsky. **PRIVATE FIRST CLASS:** George R. Graf, Edwin Rhodes. **PRIVATE:** Francis J. Foye, Paul Panosian.

(Continued on Page 32)

OAK LEAF CLUSTER TO DISTINGUISHED FLYING CROSS

MAJOR: John Dougherty. **LIEUTENANT:** Curtis J. Holdridge. **TECHNICAL SERGEANTS:** Stanley C. Jackola, Fred S. Secrest. **STAFF SERGEANT:** Douglas H. Logan, Lloyd D. Whipp. **SERGEANT:** John J. Wilfley.

SOLDIER'S MEDAL

TECHNICAL SERGEANT: Lee R. Embree. **STAFF SERGEANT:** Moses B. Tate. **SERGEANTS:** Norman L. Johnson, George J. Manger, Edward L. Schmidt. **CORPORALS:** Joseph H. Hanccek, Luther O'Neal. **PRIVATE FIRST CLASS:** Leon A. Thomas.

AIR MEDAL

MAJOR GENERAL: Hubert R. Harmon. **COLONELS:** William C. Bentley, John K. Gerhart, Arthur W. Gross, Benjamin S. Kelsey, A. J. Kerwin Malone, Elliott Roosevelt. **LIEUTENANT COLONELS:** William Basye, Elwin H. Eddy, Cass S. Hough, Herbert Morgan, Jr., Donald N. Wackitz. **MAJORS:** Owen G. Birtwistle, Adam K. Breckenridge, Rich-

MISTAKES IN "ON THE LINE" PICTURE on Page 26

(Beginning at lower left corner)

1. You on the left, buddy. That file looks big enough to whittle a horseshoe. It's pure folly to attempt to dress those threads that way. Return the cylinder head (from the propeller control unit) to the machine shop for rethreading.

2. Hey, you on the stand, there's a tool lying on the edge of your maintenance stand. The slightest shift of your foot and . . . konk . . . it's on your friend's head.

3. Nix on tightening that retaining nut with a screwdriver. To get the proper leverage and tension use the specified bar. Reference: T.O. 03-20A-1.

4. And look what you've done. Believe it or not, it does happen. The mech installed that prop by hoisting it right off the maintenance stand, locking the stand between the prop and the engine. Now the prop will have to be removed to get the stand free.

5. That maintenance stand must be our jinx this month. Another offense: It's rubbing against the spark plug terminals. T.O.'s give you essential information but you're expected to use common sense along with it.

6. And, Sergeant, the wheel locks haven't been tightened on the maintenance stand wheels. After all, it isn't a tea cart.

7. There's a rear cone on the floor in front of the stand. Could it be that the mech forgot to install it? Reference: T.O. 03-20CB-2. Besides, what's that rear cone doing on the floor anyway? The surface of the rear cone is machined and polished and shouldn't be exposed to scratching or other possible damage. Never leave it carelessly on the floor or allow other surfaces to nick its finish. (Incidentally, that bar resting on the rear cone is the tool that should be used to tighten the retaining nut instead of a screwdriver.)

8. A torque blade beam shouldn't be wedged in the ladder. It might mean a broken ankle should the crew chief make a quick descent.

9. Now, you, on the right. Those water pump pliers are too large for tightening hose clamps. Hose clamps should be finger-tightened. Reference: T.O. 03-1-20.

10. And what's going on here? You're standing on a toolbox. It's unsafe and, besides, it might injure the box.

11. Are chocks being rationed? Or did the mechs just forget to put one under the right wheel? If the plane moves, the maintenance stand will cause the prop to lose her schoolgirl complexion. Reference: T.O. 01-60FC-2.

ard G. Buswell, Bruce K. Holloway, Dwight F. Lewis, Stephen D. McElroy. **CAPTAINS:** Arthur Kush, Edward H. Nigro, Denver V. Truelove, Laurence R. Blackhurst, Jr., Joseph W. Boone, Donald E. Bradley, John J. B. Calderbank, Kenneth K. Wallick. **LIEUTENANTS:** Oscar Aarness, Robert L. Hartzell, Arthur Eugene Aenchbacker, Donald L. Arlen, Thomas F. Armstrong. **SERGEANTS:** Donald C. Appleman, Melvin C. Bahnmiller, Robert E. Browne, Henry A. Buller, Robert E. Collins, Keith F. Colpitts (With Oak Leaf Cluster), Raphael A. Cournoyer, David C. Dodd, Charles F. Donahoe, James T. Ellenburg, Roy Ellis, Earl D. Favinger, Welton K. Fulton, Daniel E. Gable, Archibaldo Gonzalez, Zackie T. Gowen, Jr., Herman S. Haag, Wilmer J. Harverson, James M. Henderson, Thomas E. Hight, Alton H. Hinson, Warren K. Hughes, Alfred A. Ise, Joseph W. Sanders, Randy Shelhorse, Jr., Edward D. Smith, Edward H. Smith, Sylvester Stanley, Jr., Francis G. Stein, Earl E. Stevens, Jr., John H. Stoltz, John D. Sullivan, Burrel T. Thorne, Joseph R. Tokar, John E. Treon, Felix A. Trice, Dana R. Wemette, Hinson C. Witt, **CORPORALS:** Walter A. Bohnenstiel, John J. Duffy, Edmund M. Fitzjarrell, Edward C. Lindquist (With Oak Leaf Cluster), Hubert E. McKinney, Frederick T. Mayer, Phillip J. Murphy, Stanley O. Niedwecki. **PRIVATE FIRST CLASS:** Lenwood E. Benham, John Q. Brock, Abraham Levin, Bernard P. Pitts, Ralph W. Thomas. **PRIVATE:** Theodore A. Alleckson, Harry F. Arnold, Frank D. Axtell, Johnie O. Burcham, Alfred M. Faries, Ellsworth L. Kidd, Fred J. Littlewolf, Roland C. Lorenz, William G. Merriman, Leward T. Opsal.

ANSWERS TO QUIZ ON PAGE 8

1. (a) P-51.
2. (b) Prevent the spread of respiratory diseases.
3. (b) Gasoline.
4. (b) False. The command, right step, march is executed starting with the right foot.
5. (c) Calcium hypochlorite is inappropriate. It is a chemical used in water purification. Benzene and Carbon tetrachloride are cleaning fluids.
6. (c) Mister Jones.
7. (b) The wing loading.
8. (d) Parade rest.
9. (b) False.
10. (c) Hung on the recipient's neck, suspended on a ribbon.
11. (b) $\frac{1}{2}$ inch below top of shoulder seam (see AAF Reg. 35-11).
12. (c) 110 feet.
13. (a) True.
14. (c) Wind direction indicator.
15. (c) A theodolite is used by meteorologists to follow the ascent of the gas filled balloon in checking wind velocity and direction.
16. (b) Captain
17. (b) Florida.
18. (b) Prevents a turret gunner from shooting into the tail, the propeller or the other surfaces of his own plane.
19. Mustang.
20. Hudson Bomber.

PICTURE CREDITS

7: Royal Air Force. 8: British Information Service. 9 and Back Cover: AIR FORCE Staff Photograph. 39: First Motion Picture Unit, AAF, Culver City, California. All other photos secured through official Army Air Forces sources.

FLIGHT TO NAPLES

(Continued from Page 7)

Clusters drop out horizontally and, a few feet below the plane, the six little bombs split away from each other and point their noses down toward the target in a long parabolic arc.

"Bombs Away! Bomb bay doors closed."

Suddenly two bursts of flak went off directly between us and the other wing ship. I could hear them both faintly. Then about five seconds later there was a tremendous explosion which seemed to come from behind my seat. I could hear pieces of metal tearing through the plane in several places. The cockpit was filled with dust and smoke, and for the first time I could smell the acrid garlic-like odor of the charge.

The flak had gone off just below our plane, causing it to lurch violently. The number two engine began to wind up like a siren. I looked at the tachometer and saw it passing 2500. I glanced at the pilot. He nodded. I shut off the engine and feathered the prop. Another explosion came from the starboard side. I glanced at engines three and four. Oil was gushing from the top of number three. I cut it off, too, and feathered. Casey and I were both thinking the same thing: "Did one of those explosions get number one or four?"

WE had lost so much speed that our element was far ahead of us. I saw the second element of three planes, led by Lieutenant David W. Bishop, snuggling in on our wing to give us protection from the fighters which were now swarming about.

We kept the throttles on our two engines wide open. We dived and turned until we were out of the anti-aircraft zone. But the Messerschmitts, Reggianis and Macchis were still on us. We could hear the pounding of every gun on our plane. The gunners knew that they were fighting for dear life and the sound of their guns proved it. After the first attempt, the enemy fighters decided not to press the attack. We all breathed easier when we discovered that no one on the plane had been injured and that we could hold our altitude without forcing the two remaining engines too much.

On the long journey home I suppose the Mediterranean was just as beautiful as it had been on the trip out, but somehow it didn't have the same appeal. During the entire day there wasn't anything that looked as beautiful as our home base as we circled it prior to landing.

Casey made a beautiful landing. When the wheels touched the ground "The Gremelin" swerved sharply to the left, the first indication we had that the left tire had been punctured by flak. But Casey kept the plane on the runway with the number one engine.

When the engines finally came to rest and all was quiet, Casey turned to me with a smile and said, "Those Italians really take that 'See Naples and Die' stuff seriously, don't they?"

"I think the Italians will remember today, too," the intelligence officer said as he wrote the report of our bombardier. *

AIR-GROUND COOPERATION IN NORTH AFRICA

(Continued from Page 6)

be heavily populated with refugees. Ferryville, itself, was packed with civilians whose pleasure in seeing the Allied commanders in the city was very genuine and quite moving. The city showed no evidence of the war at all. The waterfront area in Ferryville, however, was a twisted shambles of steel, broken concrete and sunken ships.

The road from Ferryville to Tunis was difficult; the center and sides were littered with damaged and burned out trucks, armored cars and tanks. It was on this road in the American 2nd Corps area where we had dispatched some 240 fighter-bomber sorties to work on the 15th Panzer Division when it had endeavored to move south to escape the 2nd Corps but found the 9th Corps blocking its way to Tunis and then tried to turn around and move back on the same road. The effectiveness of the fighter-bombers on the 15th Panzer Division was evident all over the road. Truckloads of rations were standing on the road showing evidence that they had been hit by machine gun fire or by aircraft. Piles of rifles were beside the road where fleeing troops had obviously thrown them. The evidence of a defeated and panicked, trapped German Panzer Division was everywhere at hand.

Tunis, itself, is a large, modern, attractive city. It also shows almost no effects of the war. For in Tunis again we had no objectives in the city but many objectives in the harbor and in the unloading facilities there. Here in Tunis, also, was a heavily populated city through which a sharp line might be drawn. On the waterfront side of the line, the effect of the war is vivid; warehouses, docks, piers, planes, ships and all waterfront installations were smashed debris. On the other side of the line is an attractive, unscathed city. Both the effectiveness of our bombers and the accuracy of our bombing is graphically illustrated.

With General Alexander and Air Marshal Coningham, we landed at El Aouina on the 9th in what was probably the first combat airplane dispatched to that airfield without a load of bombs. El Aouina had been a principal transport operating base for the German air force. It was littered with a gratifying number of wrecked Ju-52s and Me-323s. There was also a considerable number of combat aircraft which we could fly away after very little maintenance and repair.

The Northwest African Tactical Air Force was our most completely integrated allied air establishment in the theatre. We maintained the national integrity of only two of our major units. They were the two major fighter commands in the north and in the center. The center group was an American unit which retained its original name for administrative purposes rather than any other reasons.

It was the 12th Air Support Command which throughout the battle was com-

mended by Brigadier General Paul L. Williams. Williams' command consisted of three of our fighter groups led by top-notch fighter commanders our Colonels Momyer, Dean and West, and an observation unit commanded by Major Dyas. These three fighter groups are now outstanding fighter organizations and are able to meet any enemy any place in the world. It is most reassuring to know that those American groups completed the last day of the intensive operations in this battle at a greater strength than ever before. The flow of aircraft into the theatre fully met all requirements and resulted in our having full strength, battleworthy, experienced air units where one might ordinarily expect tired, worn and under-strength air commands.

The Tactical Bomber Force was an integrated unit consisting of a superb light bombardment group commanded by Colonel Terrill.

This group also included two B-25 squadrons with long experience in battle area bombing which had been moved to this front from the Western Desert Air Force, an RAF light bomber wing and French night bomber unit. The tactical bomber force was commanded by Air Commodore L. F. Sinclair, an outstanding light bomber leader whose skill and gallantry is justifying his long service throughout this war and his George Cross, DFC, OBE and several other high British decorations.

The Western Desert Air Force similarly, was an integrated unit consisting of many fighter squadrons, including our excellent 57th and 79th P-40 fighter-bomber groups. The 57th and 79th had come across the Western Desert with the Western Desert Air Force and showed the skill, experience, strength and toughness which that drive across the desert had instilled in all of the components of the force. The Western Desert Air Force had a number of light and medium bomber units in it, in which our 12th medium bomber group, equipped with B-25s and commanded by Colonel Bachus was a star unit. The Western Desert Air Force was commanded by Air Vice Marshal Harry Broadhurst. Broadhurst had been one of Air Marshal Coningham's principal commanders when Coningham commanded the Western Desert Air Force in its long drive across the desert.

THUS it is seen that the Northwest African Tactical Air Force, operating directly under General Spaatz' Command, as one of the major components of the Northwest African Air Forces, was an almost integrate Allied air effort with its RAF commander, Air Marshal Coningham, and an American deputy commander, four major units, two of which were about half American and half British. The desire to respect the national integrity of air units is a real one and a worthy one. However, to win this battle, the keynote in our employment of

our Air Forces was the word "concentration." When we wanted to use bombers in front of the 8th Army or in front of the First Army, we found it much more effective to direct one bomber unit into that operation than to direct an American bomber complement and a British bomber complement. We were guided solely by the military necessity that the full advantages of the ability to concentrate great masses of aircraft on the vital point take priority over all other considerations. Among the air units, the result of this Allied effort was most satisfactory. The American Command is proud of the RAF units it had the privilege to handle. The RAF Command states it was similarly deeply impressed by the American units under that command. We are assured that the Allied effort in the air when the battle requires it need not be confused by barriers of nationality.

The complete illustration of air and ground command planning and working in closest coordination may be summarized in the daily intelligence and operations conference at the combined Air-Ground Headquarters, Tactical Air Force, 18th Army Group. Each day the Ground Operations officer presented in detail the previous 24 hours' operations on the ground, and the air operations officer presented the day in the air. The ground intelligence officer then presented his concept of the enemy's current situation on the ground and the air intelligence officer presented the enemy situation in the air, after which General Alexander and Air Marshal Coningham, or in his absence, his American deputy, discussed the immediate situation and future operations. When the air and ground commanders were at the map after this daily conference, one saw the cockpit from which the air-ground war was controlled. The air commander not infrequently pointed out specific locations on the front which would improve the air situation if captured.

The ground commander would examine that particular location and if possible direct the Ground Forces to move on to those specific localities. In this manner, Ground Force support to air operations continually recurred. Similarly, the Ground Force commander would find the spot at which the ground effort had been hampered by the German air force. Normally the necessary movements were made and action taken by the air commander to further the effort on the ground in that particular location which was, in turn, air support of recurred. Similarly, the Ground Force and its final result showed to very high order the soundness of the airman running the air war and the soldier running the ground war, but working coordinately and with striking success toward the same objective.

This close teamwork by allies was not only in the air effort but in all operations of General Eisenhower's allied command. ☆

TAKING THE KINKS OUT OF TRAINING

By Col. Edward H. Underhill

DIRECTOR OF TRAINING, CENTRAL INSTRUCTORS' SCHOOL, RANDOLPH FIELD, TEXAS



WE HAVE taken pains to see that our Army Air Forces has the best team in the conference in the matter of players and equipment. Now we can devote more effort to strengthening the coaching staff. That's the reason for the Central Instructors' School at Randolph Field.

The Army Air Forces has expanded tremendously in the past three years. Naturally enough, the Flying Training Command, responsible for training all pilots, was the first to feel the effects of this growth; and the growing pains have been severe and prolonged.

Not the least of these pains was caused by the shortage of qualified flying instructors.

This problem was solved by selecting students at the advanced schools to be instructors. After graduating, they are given additional flying time and instruction and then placed on duty as full-fledged flying instructors.

That the solution was correct is proven by the fact that our pilots go to combat better trained than those of any other nation.

It did have some faults, however, and the principal fault was the short amount of time available for additional instruction. This necessitated the training of instructors at their assigned stations, which led to variations in the kind of training given them and, consequently, to the students throughout the Flying Training Command.

Some instructors would emphasize one phase of training to the probable neglect of others, either because they considered the latter phases relatively unimportant or were unable to present them correctly to the student.

The result was just as though you had a dozen cooks in one kitchen, each trained by a different chef but all trying to do the same work.

One cook might have learned to prepare some excellent egg dishes, since his teacher made a specialty of that line, but he won't be able to roast a leg of lamb. A meat ex-

pert won't be able to handle the egg dishes. So the meals won't be too consistent in quality.

Now that the expansion is not so rapid, the growing pains are not so severe; time, equipment and personnel can be spared for more thorough training of instructors.

The Central Instructors' School at Randolph was established to produce competent, thoroughly qualified Flying Instructors, and to standardize the instruction of students throughout all of the pilot training schools. All instructors in the Flying Training Command will eventually come to Randolph before they start teaching.

The best methods found in any one place will now be made available to all. We shall constantly have access to the latest information pertaining to our assignment. We will learn anything developed at any of our training fields. Three of our departmental directors have observed RAF training methods and are giving us the benefit of their findings. Men returning from combat areas will bring information of value. The instructors leaving here after receiving their training will take this knowledge with them.

Also, this school will serve as a laboratory for evaluation of new training ideas, or conflicting theories about existing methods. No other training field has this set-up.

In the twin-engine division, for instance, 2,000-mile cross-country flights in the C-60 type of craft are soon to become an impor-

tant part of the curriculum. Pilot, co-pilot, radio operator, navigator and engineer will participate in these flights and will gain experience they could get in no other way except on long-range combat missions. This procedure is brand-new to flying training.

In the same division, the initial phase of instruction has been concentrated on disproving certain false beliefs the average trainee brings with him about twin-engine aircraft — beliefs which would nullify his ability to serve as a competent instructor were they allowed to exist.

Specifically, the false beliefs concern the AT-9 and AT-10 twin-engine planes. Many pilots believe these planes can't be safely flown when operating on only one engine. They believe it impossible to turn into a dead engine, and word-of-mouth has established a landing speed for single-engine operation of the twin-engine craft some forty miles in excess of the speed at which these planes can actually be landed.

The scarcity of experienced twin-engine pilots in the early days of this type of instruction and the guesswork basis on which qualified single-engine pilots attempted to fly multiple-engine craft gave rise to these false beliefs. Before his first week here has closed, the instructor-trainee is freed of these flying "superstitions."

Also, to accomplish more efficient training, the Central Instructors' School has set about to eliminate the "cockpit-riding" type of instructor—the fellow who attempts to instruct his students with verbal whip-lashes. Trainees are being schooled in an intelligent and understanding approach to the problems of each student. They are constantly being impressed with the fact that they must not be slaves to a tradition.

Development of curricula hence will be an important service of the school. Along with this we shall give considerable time to development and improvement of training aids, such as films, charts and mechanical devices.



This will not be an advanced flying school. The instructor-trainees must be good flyers when they get here. They are especially selected, so they'll have to be.

However, they will learn precision in their aerial maneuvers. A man in combat may be too busy to do a maneuver in an exact fashion. But an instructor must be precise to show the student exactly what he is trying to put across.

Not all of the work is done in the air. In the ground school are taught such courses as "Analysis of Maneuvers," "Psychology and Technique of Instruction," "Operational Procedures" and "Aeronautical Equipment." Some of the courses are general and apply to all types of training. Other courses are specifically designed for a particular type of training — Primary, Basic, Advanced Single-Engine or Advanced Twin-Engine.

The means of putting across the knowledge he already has is what we are trying to give the instructors. They learn just *why* each maneuver is made, what it does for the student, and *why* it is in the curriculum. They are taught what abilities are necessary for each performance and what a new trick will teach the student. The purpose, technique, training value, and proficiency required in every individual act of flying are analyzed.

This analysis of maneuvers is taught in the ground school, along with psychology of instruction, operational procedure and

A standardized course for flight instructors is introduced at Randolph

aeronautical equipment. In the psychology of instruction, the trainee will learn to study his students' personalities, abilities, and reactions to all phases of training.

Means of instilling confidence in the cadets are an important phase of this subject. Many a potentially great flyer has been ruined or retarded because he was allowed to lose confidence early in training. Under operational procedure come such subjects as planning and supervising night flying and cross-country flights. In the courses on aeronautical equipment the instructor-trainee will learn just what can be expected, and what cannot be expected, of each part of his plane.

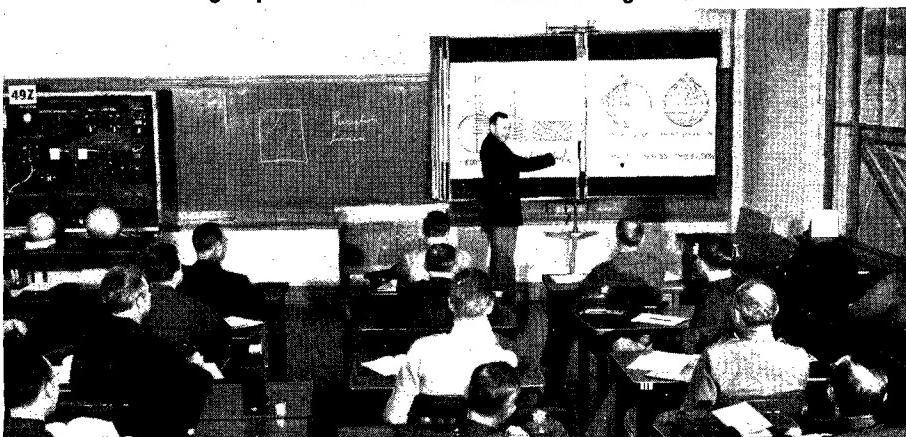
Instructors required for the Ground Schools and for the Military Training of Cadets are also produced by the CIS. They are given additional instruction in their specialties and instruction in methods of teaching, and in the use of training aids, films, synthetic devices, models, and so forth. A large part of their course will be devoted to actual instruction of classes under the supervision of experienced personnel.

The ground training is divided into three parts — the pilots' ground school, for the flying instructor-trainees; the ground school; and a tactical officers' school.

These instructors in twin-engine advanced flying at the Randolph Central Instructors' School (below) enter the "classroom" in which they teach — an AT-9. Left to right: Lieuts. D. J. Kingsbury, New York, and E. G. Harrington, Wisconsin. At right, Major E. G. Righetti, outlines a formation to Capt. W. J. O'Donnell.



Lieut. Robert H. Cuyler, former associate professor of geology at the University of Texas, lectures on maps and charts before a group of officers who soon will become ground school instructors.



The "tac" officers' school is expected to fill another long-felt need in the Army Air Forces. It has been a problem as to how much "military" the cadets should have. In the old days, when there was more time, rigid class system was in effect. The cadets learned courtesy, discipline and responsibility through the merciless ministrations of the upperclassmen.

But we're in a war and the frills have had to be eliminated. Pilots must be turned out at the fastest rate compatible with efficiency. Hence there has been a problem of just how much time and effort should be spent on the strictly military phases of training. It must not interfere with flight training. Yet it has been shown on the war front that pilots must be able to assume responsibility and to take orders—to function as members of the teams essential in modern air operations. Such abilities are not stressed in the ordinary course of flight training.

The amount of "military" training has varied greatly at the various schools. Now we are standardizing this, as well as the flight training, to assure that the cadets will become good officers besides good flyers.

All of this implies that the general level of instruction will be raised throughout the Flying Training Command and I believe that this will result. With the wealth of information, ideas and developments of every school available to us there is every reason to believe the new program will be successful. ☆



SYNTHETIC DEVICES . . . BOON TO WARTIME TRAINING

TODAY more than ever before, the training problems of the Army Air Forces at war have to be met in major degree by the use of synthetic devices. The necessity for the conservation of critical materials, aviation gasoline, man hours on the part of both students and instructors, and lives of future combat pilots has called for the maximum use of gadgets which provide short cuts.

C.O.s and instructors are daily saving themselves headaches by the successful employment of synthetic train-

ers now available for use. Scores of officers and men and commercial engineers are working overtime to develop others which may aid in the AAF training program.

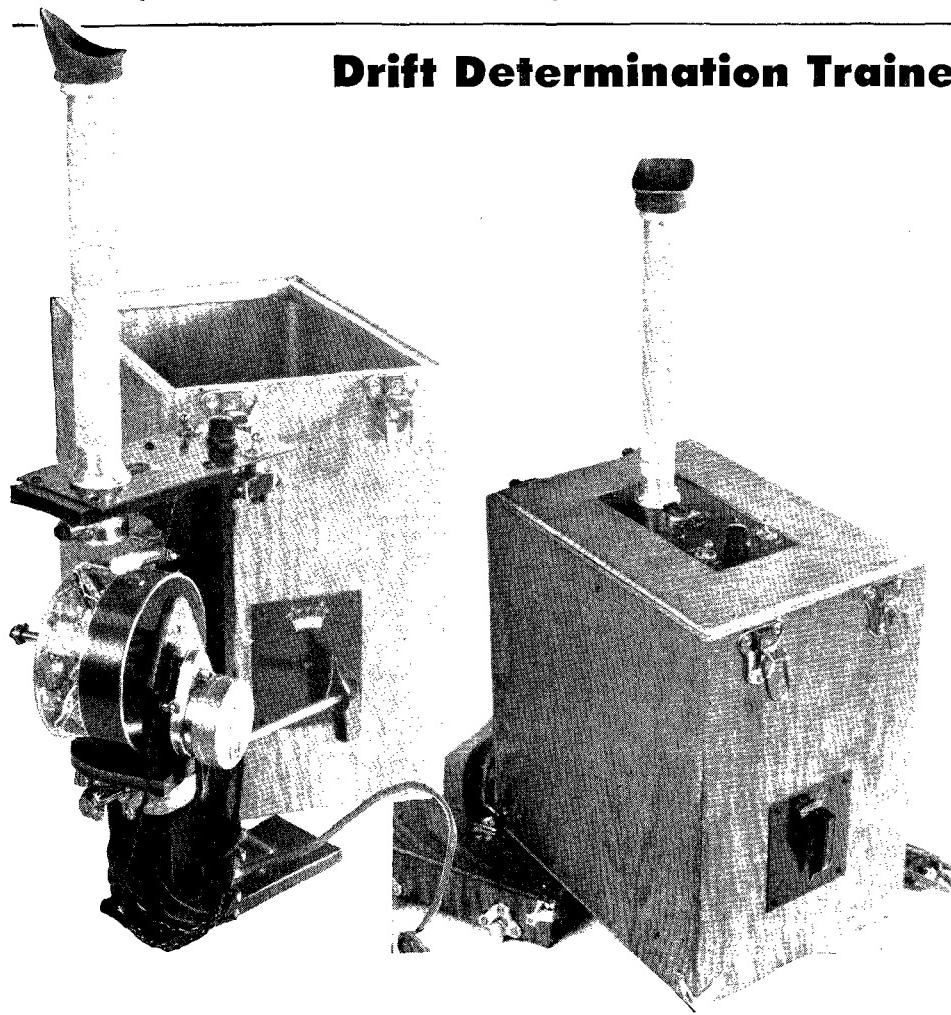
Now on display at the headquarters of the AAF Training Aids Division, Park Avenue and 32nd Street, New York City, are most of the available synthetic training devices, recognition equipment, training films and strips, training literature and posters. The demonstration is primarily set up as a shop window for C.O.s and instructors

who may have the opportunity to visit the headquarters.

AFTAD's "stock" of training aids was collected from the AAF, the Army Ground Forces, the Navy, the RAF, RCAF and commercial manufacturers. Catalogs listing materials available through each section of AFTAD are being distributed to headquarters of AAF Commands and training Air Forces.

AIR FORCE from time to time will describe selected items of equipment available for training within the Air Forces.

Drift Determination Trainer

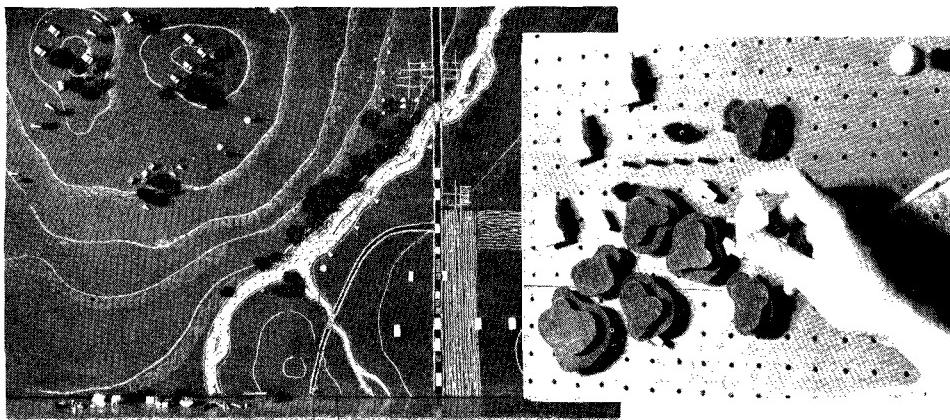


A DRIFT determination trainer has been designed to aid student bombardiers, navigators and pilots in acquainting themselves with a fundamental factor encountered in navigation. To teach students to operate a drift sight by the usual classroom method requires considerable imagination on their part. This factor is eliminated in using this device (left), which simulates drift in flight.

The trainer consists of a simple drift sight, a motor driven cylinder and a rheostat-controlled light source. The cylinder contains aerial map photographs of land and sea. In spots, the cylinder has been perforated to allow specks of light to filter through, simulating ground lights at night. A constant speed motor rotates the cylinder to give the effect of ground speed. A set of switches is provided to control the interior lighting providing either day or night problems. Rheostats control the intensity of interior lighting and illumination of the drift sight grid.

In operation, the instructor, by means of a lever on the side of the box, sets the desired amount of drift. The pupil then sights through the tube of the sight, adjusting it to determine the drift angle. Upon completion of the operation, the instructor makes any necessary corrections in the student's results.

This instrument is approximately one cubic foot and can be placed conveniently on a desk. It is commercially manufactured and operates from 110-volt light service.



Tactical Board

A BOARD designed as a tactical map, (above) has flexibility in its possible uses. The board is made up of four sections, each 4 by 2½ feet. The surface of the board is plywood, finished in several layers of abrasive silicate blackboard paint of olive green color. The boards are perforated at one inch intervals to accommodate the assortment of models required in each situation. The small models are pegged, enabling an instructor to place the board vertically in front of the class for better vision.

White and colored chalk may be used in laying out a problem, and objects necessary for illustration of combat principles and problems may be applied in any desired

manner. Examples of some of the peg models that are available with a board are vehicles, pill boxes, trees, bridges, high and low flying and grounded airplanes, tanks, command posts and hangars. Changing the situation on the board is easily achieved by moving the object as required. Instructors who might otherwise be handicapped by lack of practice in handling chalk on a blackboard could make a clear demonstration.

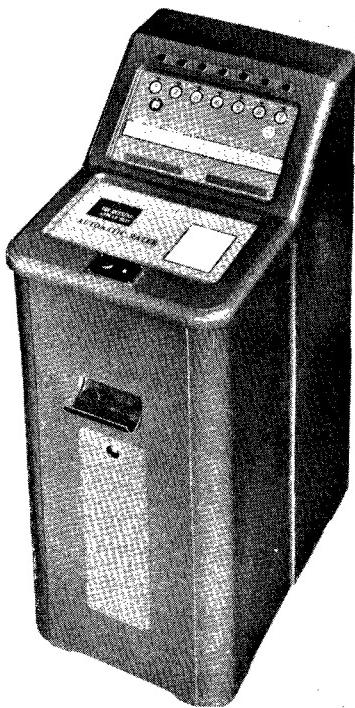
Sections of this board may be added to give a larger map and, if special terrain features such as large mountains are required, they can either be obtained with the board or manufactured locally. One of the features of this board is its visibility due to the contrasting colors and three-dimensional objects.

Automatic Rater

AN automatic rating device (left) presents to the student a series of question cards pertaining to various military subjects and automatically records his score based on correctness of answers and speed of answer selections.

When the student presses the starter button, a card appears in the window at the top of the machine. This card presents a question and several possible answers from which the student makes his selection. He then presses one of seven numbered push buttons corresponding to the answer which he considers to be correct.

The machine records a score based not only on the correctness of the answer but also the time, within a range of twenty seconds, required by the student to make the correct selection. The student is given four seconds to read the question. If he presses the correct button immediately, the "correct" light shows on the machine and he receives twenty points for that question. If



he delays while thinking about the correct answer, his score is reduced one point per second. If the student presses a button corresponding to an incorrect answer, the "incorrect" light will go on and no score is recorded. The card is delivered through a chute to the student after each play. He may thus ascertain the correct answer in case he has been in error.

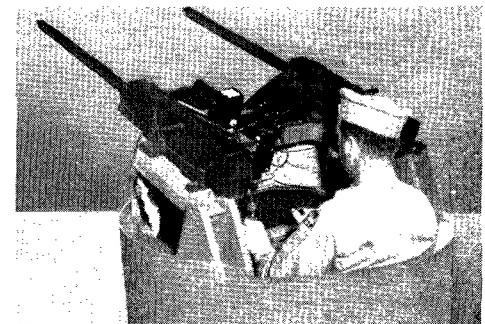
By pressing the starter button again, the student releases another question card into the window of the machine. A total of ten question cards may be played consecutively, after which the "reset" button must be pressed.

The machine may be loaded with a maximum of 800 cards at one time presenting questions on aircraft and ship recognition and a number of other subjects. Latest models of the device may employ film strips rather than cards. About 4 by 6 feet of floor space is required by this commercially produced device. A 110-volt light circuit supplies sufficient alternating current for power.

Turret Trainer

EFFECTIVE use is being made of a turret trainer in giving the potential turret gunner economical training in smooth turret manipulation. The turret closely resembles real equipment in appearance (see below) and operation and the controls are identical with those on operational turrets.

A training reflector sight or spotlight can be readily attached to electrical connections in the trainer. Patterns may be drawn or mechanical moving targets may be mounted



on available wall space (or on wires) for the student to follow. A free spotlight can be used to project a beam of light upon the target in order to observe the degree of skill with which the student manipulates the turret. In using the trainer in this manner, the 120-degree azimuth and 70-degree elevation of the trainer offer no handicap to its efficiency.

A 110-volt, 60-cycle light source operates this device. It is of commercial construction.

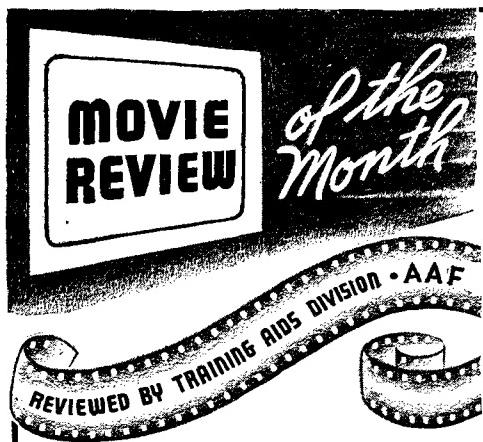
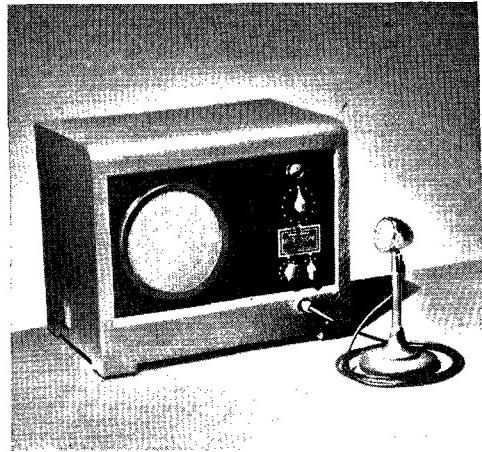
Mirrophone

As its name implies, the Mirrophone mirrors one's voice or other sounds and immediately "phones" back to an individual or group the voice or sounds recorded.

For a full minute, the Mirrophone's magnetic tape records sound of any kind—individual or group messages, conversation, music, code messages or portions of radio broadcasts. At the flick of a switch, the Mirrophone instantly stops recording and begins to play back over its loudspeaker the sounds it has picked up. The recorded sound may be reproduced over and over again. After the "repeat" switch is changed for

another recording, the new sounds automatically erase the results of the previous minute of recording on the automatic tape.

Those who use radio communications should find the Mirrophone especially useful in developing clearer speech and better technique in transmitting concise and direct messages. By listening to his own voice on the Mirrophone, a pilot or radio operator who has difficulty making himself understood can criticize himself and thus contribute to a more effective communication system. An output jack on the machine permits connection with an external loudspeaker or another recording machine if permanent records are desired.



"Learn and Live"

Hollywood star Guy Kibbee, who gave his services gratis to the Air Forces training film program, dons the robe and halo of St. Peter to put across some timely lessons in flying safety in TF 1-3300 "Learn and Live." St. Peter and Joe Instructor reminisce over the earthly fate of some of the pilots who are seen wearing wings in St. Pete's Pilot's Heaven. Their conversation sets the stage for flashbacks to the pilot errors that brought a typical few of the boys into Pilot's Heaven: Hank with the empty tank, the familiar guy with propellers in his pants and in too much of a hurry to check temperature gauges before take-off, the hotshot pilot who liked to stunt at low altitude and the egotist who thought many of the routine flight orders were meant only for others, to mention only a few. "Learn and Live" is a film for all pilots, whether beginners or advanced. (For more details see Page 39.)

"Flexible Aerial Gunnery . . . Making a Gunner"

"Flexible Aerial Gunnery—Making a Gunner" (TF 1-760), released last month, shows how aerial flexible gunners are made—a survey of what goes into their weeks of intensive instruction, the tools and armament they use, a preview of what the prospective gunner can expect, a story substantiating the statement that "gunners are made, not born." "Making a Gunner" is the first of a series of six training films being produced under the general title of "Flexible Aerial Gunnery." Already complete are two others, TF 1-762 "Arithmetic for Battle" (background material for instruction in harmonization of guns and sights) and TF 1-764 "Range Estimation" (estimating target range with the sight ring). Titles of other films to be completed soon are "Bullet Between You and Your Target" and "Estimation of Lead."

"Fifty-Hour Inspection of The B-24D . . The Airplane in General"

This past month saw the release of the first in a series of aircraft maintenance and inspection training films especially designed for the ground crews who keep the crates in the air. "Fifty-Hour Inspection of the B-24D—The Airplane in General" (TF 1-818) shows the procedures followed in the first phases of the 50-hour inspection of a B-24D—washing down the plane and engines, exterior surface inspection,

checking the flight controls, emergency hatches, and other details called for in columns 31, 32, 33 and 34 of Form 41-B. Four additional training films will follow at an early date, to complete the details of the B-24D inspection. In addition to this group on the B-24D, production is well along on other films dealing with the 50-hour inspection of practically all types of bombers, fighters and cargo aircraft.

"Photo Intelligence in Bombardment Aviation"

Welcome news to the bombardment intelligence officer and the air crew personnel with whom he works is the release this month of a new AAF training film, "Photo Intelligence In Bombardment Aviation" (TF 1-3306). Through the medium of a dramatic story which has its beginning at a bombardment headquarters "somewhere in England," this film depicts the role of photographic reconnaissance in air warfare, the futility of photo reconnaissance unless it is interpreted correctly, and how correct interpretation of reconnaissance photos enables the bomber crew to spot a difficult target.

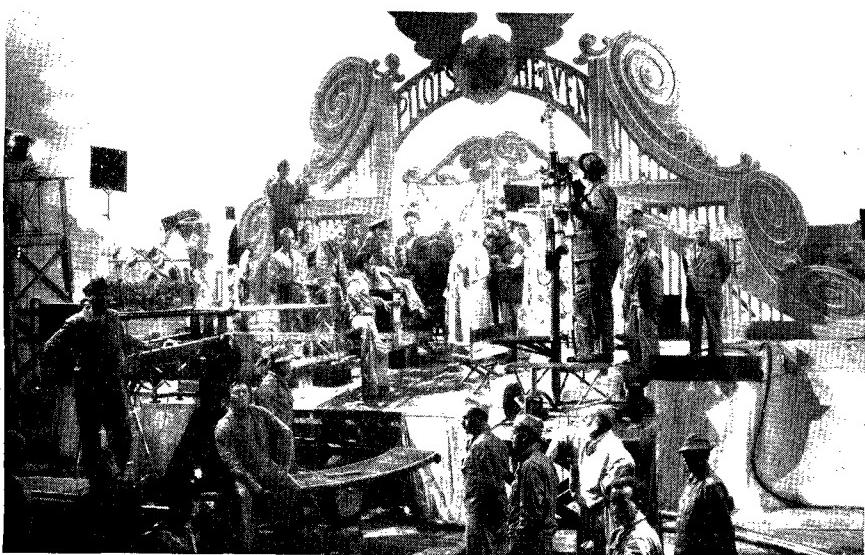
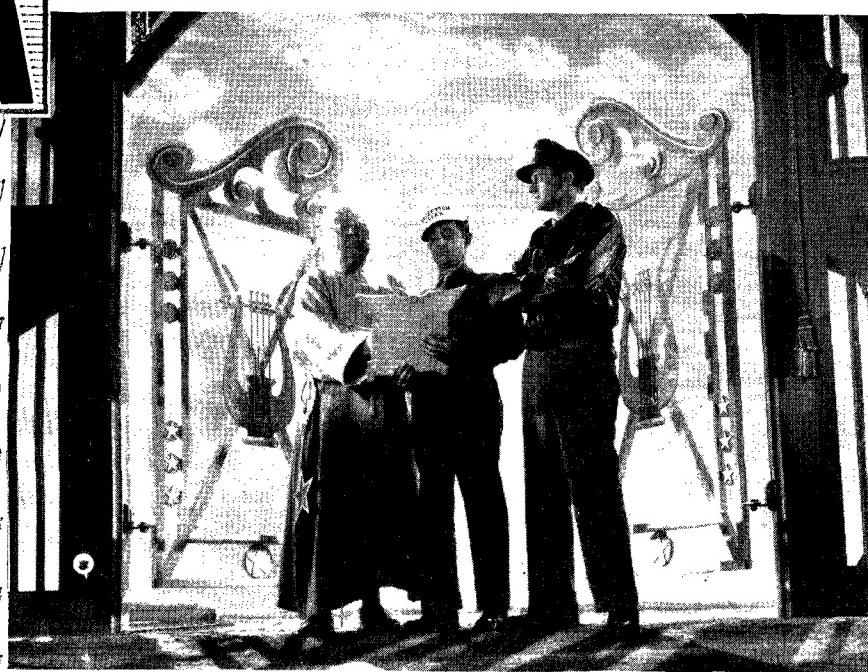
(All films produced by AAF Training Film Production Units.)

TRAINING OFFICERS, ATTENTION!

Ask for them. Your command headquarters has copies for you of AAF Training Film and Film Strip Catalog—First Edition, and Supplement No. 1.

A GLIMPSE OF PILOT'S HEAVEN

Employing a novel motion picture treatment to teach a vital flying safety lesson



EVER hear of Pilot's Heaven? It's the place that flyers go who insist on learning their lessons the hard way.

Of course, nobody ever came back from Pilot's Heaven but the AAF's Directorate of Safety Education and the First Motion Picture Unit have collaborated to produce "Learn and Live," a movie that shows the place in all its detail. It's a dull, drab place. There is no flying, there are no girls and even the pool tables click with eight balls exclusively.

Undesirable as this fictional residence might be, St. Peter (Guy Kibbee) is face to face with a housing problem. Pilots are coming in faster than he and his assistants can care for them. This gives rise to an emergency call for Joe Instructor. St. Peter puts it squarely up to him to cut down the rate of entrance. By way of

reply, Joe reviews how each of the present restless, unhappy inmates got there.

As St. Peter listens to these stories (dramatized on the screen) of carelessness, inattention and mistakes of all kinds, he occasionally is moved to observe, "The devil you say!" Whereupon his neon halo flickers and goes out only to re-light brighter than ever for the next incident.

There is nothing new about the use of motion pictures in flight training, but this film is a far cry from the usual class-room presentation. Designed for use in either post theatre or classroom, "Learn and Live" is as good for entertainment as it is for the lessons it teaches. It is sixty minutes of good sense wrapped up in a neat package.

Ideally, of course, good pilots will absorb good sense without the trimmings.

Likewise a hungry man will eat almost any kind of food regardless of how it looks, but if it's made attractive he will eat a lot more of the right things. Director of Safety Education, Major Robert L. Steinle, figures the same way about safety lessons. Safety isn't a bit more interesting than a raw potato. But the same things can be done to make safety attractive as can be done to make a potato practically irresistible.

Professional excellence in this film was assured by the talent of those who produced it. Guy Kibbee as St. Peter brings top-flight acting ability to the production. Most of the personnel of the First Motion Picture Unit are former top-ranking members of the motion picture industry.

The project was under the general supervision of Lt. Colonel William Keighley, chief of the motion picture division at AAF Headquarters, and Major Paul Mantz, commanding officer of the First Motion Picture Unit. One of the movie industry's top peacetime executives, Major Owen Crump, chief of the production department, produced the film, while Lieutenant Edwin Gilbert, one of Hollywood's finest writers, turned out the screen play. The musical score was created by Alex Steinert and arranged and conducted by Dave Rose, using eighty musicians now members of the Santa Ana Air Force Band.

"Learn and Live" is the forerunner of other films in which the same techniques will be used. ☆

HAVE THE BEST CREW OF THEM ALL

(Continued from Page 16)

Pilots, navigators and bombardiers aren't the only crew members to get a thorough briefing before a mission. Enlisted men are given a fill-in on details of the flight—the target, route in and out, concentrations of flak along the way and near the target, enemy fighter, airdromes, type of fighters to be expected, enemy interception tactics and the like—and later, radio operators are given a special briefing by the Communications Officer who distributes log books and several sets of signals.

Flimsies containing such information as the call sign for code, the voice call sign, all frequencies and flying control stations also are given each operator.

You can't put too much emphasis on the necessity for the destruction of all data and equipment which may be of value to the enemy in the case something goes wrong on a mission.

A THOROUGH check of all equipment is absolutely essential before taking off. In addition to the careful inspection of your radio equipment and gun, you also should check your ammunition, parachute, life rafts, clothing, escape kits and make sure the kit knife is located where it can be found quickly. This is important. Your oxygen mask may freeze and that knife will come in mighty handy when you have to cut the tube and get your oxygen supply direct—to name only one of its many uses.

As soon as the engines of a ship are started, the radio operator begins his log, and, I might say, you don't fool around with this log on a combat mission. It must be complete and accurate, and entries should be made at five-minute intervals at least. It would be a good idea for radio operators to get in as much log-making experience as possible before going to a combat zone. It is sure to prove a great help.

Once over enemy territory the radio operator breaks radio silence only on orders from his C. O. He buckles down to his gunnery job. While at his gun, a radio operator is in an excellent position to observe flak. It is his duty to call it out to the navigator, giving the place of burst by the clock system, the height and color, all of which is used by intelligence officers later.

A good combat radio operator should be able to take fifteen or twenty words of code per minute. He should have enough experience to perform minor repairs on both radio equipment and machine guns. A student should operate radio equipment as often as he possibly can and especially should practice interpolating and calibrating frequencies.

Plenty of "digging" in training will make things a lot easier when he gets across. In England an operator is given a two weeks' course in British radio procedure and a code check and he must pass the course before he is permitted to fly.

Aircraft recognition is particularly important in the European theatre. If you

don't watch out you may find yourself "pouring it into" one of your own fighter escort. On several missions we were escorted by Spitfires, which to me are plenty difficult to tell from an ME-109 at a distance. At times, one or two of the Spitfires would pull up over us to show they were friendly, but any fighter plane that dived toward the formation was fired on.

It also would be a good idea to get in plenty of first aid training before going on a combat mission, learning particularly the use of morphine and what to do in case of shock. This is knowledge you are sure to have a chance to put to good use.

FIGHTING FROM A TURRET

By Tech. Sgt. Carl L. Masters,
engineer

EXCEPT in case of emergency, an engineer of a B-17 operating on combat missions from England engages in a minimum of engineering and a maximum of gunnery. In my case I handled the top turret and, believe me, you can get in some good shooting from there.

The best tip I could possibly offer as a result of combat experience is KNOW YOUR GUNS—every inch of them.

In the first place, before starting out on a mission, you can't know too much about your guns when you give them that last once-over. This check-up, to my way of thinking, is the most important job of a gunner—next, of course, to his work of putting the finishing touches on an enemy fighter plane.

In England we made a practice of stripping our guns completely before a flight in order to check in detail for rust and worn parts. In this theatre don't be afraid to use oil. I remember one occasion when we were ordered to clean our guns with gasoline and then dry them thoroughly—that was all. When we took to the air there was just enough condensation to cause the guns to stick or freeze. We could fire one shot and then the guns would stick. At one point on the mission—just over the target—five guns on our ship were not working properly. In a flight of seventy planes that day, all except thirty-seven turned back due to gun or engineering trouble.

Later we found that best results were obtained from our guns simply by wiping them dry and giving them a thin coating of oil. It is important, too, to check the head space and the oil buffer, as well as the quantity of oil in the buffers to make sure they are full.

Don't rely solely on the other fellow in figuring your turret is operating properly. Specialists give the turrets a thorough going over the night before a mission, but we always made it a practice of checking their operation with the aid of a portable energizer. The energizer provides electric current which builds up the necessary hydraulic

pressure to run the turrets for this check.

Gunners should be at their positions from the time the ship leaves the field until it lands again. Be on the alert always. Enemy planes can come at you anywhere, any time.

The top turret gunner has a responsible job. He has a good view of everything happening above and on either side of the ship and he must continually sweep a full 180-degree range, depending, of course, on his plane's position in formation.

On our early missions last fall fighters were coming in head on most of the time. I got plenty of action then simply by telling the pilot to dip the B-17's nose a little. The one sure enemy fighter I have to my credit is a FW-190 that came in that way. When the enemy pilot turned to duck out of it, I let him have a good squirt right along the 190's belly.

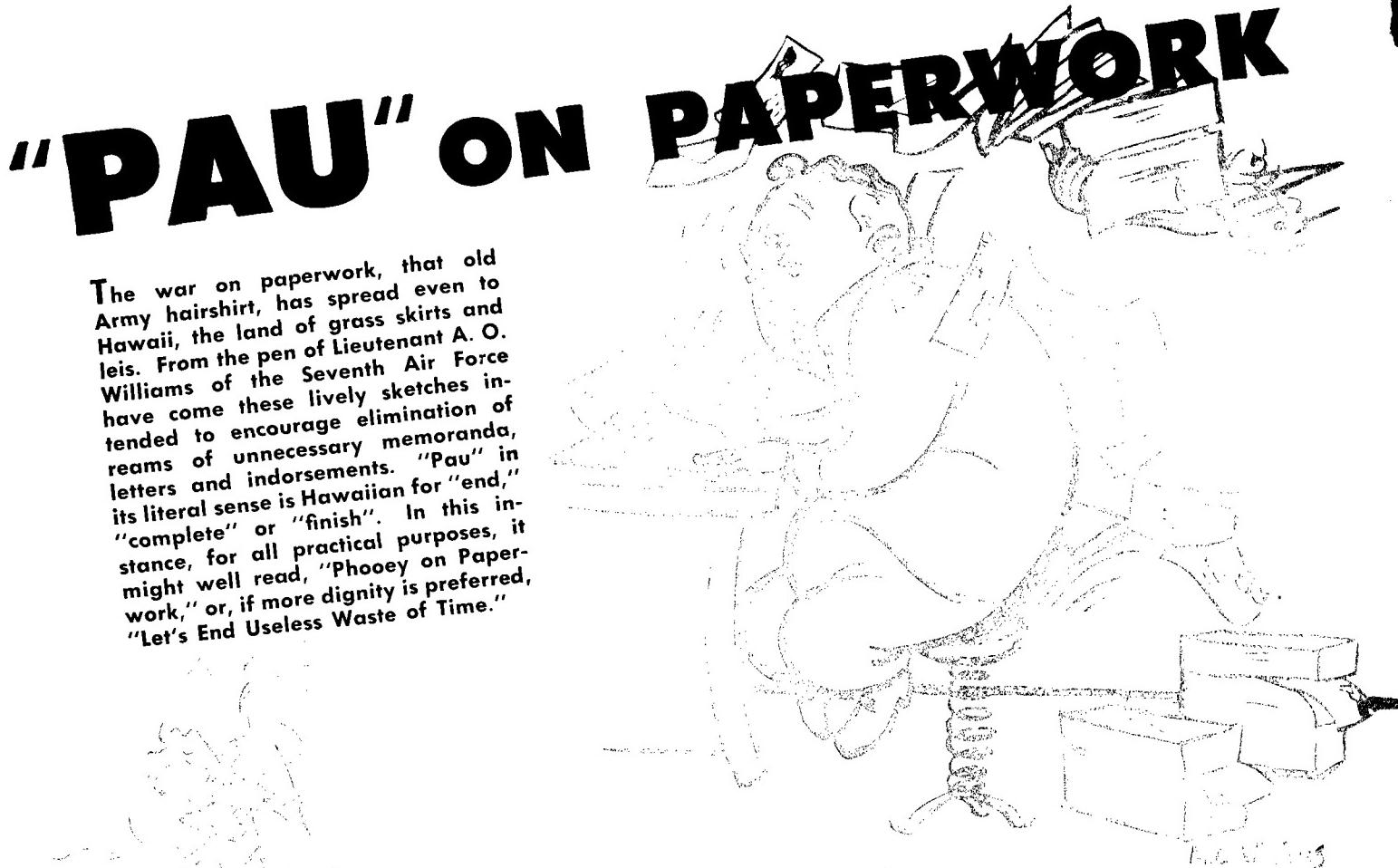
LATER, however, the fighters began coming in out of the sun. They would begin firing directly out of the sun and sometimes would be within 200 yards before we could see them. We tried putting burnt cork around our eyes to cut down the glare, the same as in football, and it helped a lot.

It's a good idea for all gunners in a crew to feel at home in all gun positions. You can never tell when somebody handling a particularly hot position is going to get knocked out and you will have to take his place. On the St. Nazaire raid, our two waist gunners were hit by flak and Sergeant DeBoy, our radioman, went back to take care of both waist guns while the co-pilot took over the radio gun. In this way we were still pretty well defended.

Coming home from a mission the top turret gunner is apt to get his roughest work because enemy fighters are usually lying in wait for the formation as it comes back off the target. In the European theatre you can count on fighters following you back to their own coast. We even had them follow us to within thirty miles of the English coast over the North Sea. The top turret gunner should stay in the turret until his plane begins circling the home field.

About the only thing a gunner has to do at the intelligence interrogation is to claim any enemy planes he shot down. It is a wise idea never to claim a fighter unless you are absolutely sure it was destroyed. Intelligence might check off enemy fighters in that particular area and the next time you and your buddies go over that territory you may be jumped by a lot more fighters than your intelligence officer warned you of. There's no glory in claiming an enemy fighter—your primary objective is bombing, not shooting down fighters—and if you claim too many you are only making it harder for yourself and the rest of the crews to gauge your opposition.

When you finish the interrogation, don't call it a day and head for the barracks. Go to the armament shop and clean your guns. There may be a mission again the next day, and it's a comfortable feeling to know that your guns are OK. *



The war on paperwork, that old Army hairshirt, has spread even to Hawaii, the land of grass skirts and leis. From the pen of Lieutenant A. O. Williams of the Seventh Air Force have come these lively sketches intended to encourage elimination of reams of unnecessary memoranda, letters and endorsements. "Pau" in its literal sense is Hawaiian for "end," "complete" or "finish". In this instance, for all practical purposes, it might well read, "Phooey on Paper-work," or, if more dignity is preferred, "Let's End Useless Waste of Time."

DON'T CAUSE A GREAT PREPONDERANCE
OF NEEDLESS CORRESPONDENCE!

SUPERFLUOUS PAPERS
MAKE ARDUOUS LABORS

THE SADDEST WORDS OF TONGUE OR PEN—
"INDORSE THAT LETTER BACK AGAIN!"

DON'T USE THE PHONE FOR IDLE CHATTER,
OR CLASSIFIED, IMPORTANT MATTER;
BUT FOR ALL ELSE, FOR GOSH SAKES GRAB IT!
GET THE TELEPHONING HABIT!

TELEWOMAN MAY BE MORE FUN,
BUT A TELEPHONE JOB IS QUICKER DONE!

YOU NEVER KNOW!



HE may be the most friendly guy in the world. Patriotic too. Chances are he is genuinely interested in soldiers and in the war effort. But he likes to talk, likes to ask questions; almost everyone does. And soldier talk is the kind of talk people repeat. Your words may be innocent enough at the time, but sooner or later they reach enemy ears. Talk like yours, pieced together with other loose talk, forms a pattern. Suddenly it becomes dynamite.

Then again, this seemingly friendly guy may be an enemy agent. You know the answer to that one.

So be smart, soldier. Don't discuss military matters, no matter how trivial, with anyone—friend or stranger. **YOU NEVER KNOW** what your talk will lead to.

AIR FORCE

THE OFFICIAL SERVICE JOURNAL

OF THE U. S. ARMY AIR FORCES



AUGUST 1943

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AIR FORCE is primarily a medium for the exchange of ideas and information among Army Air Forces personnel. Opinions expressed by individual contributors do not necessarily express the official attitude of the Army Air Forces or the War Department.

August Brief

ONE OF THE FIRST assignments for new pilots of the 14th Air Force in China is a talk with their Commanding General, Major General Claire L. Chennault. An article on what he tells them has been written for AIR FORCE by General Chennault and it appears on Page 6 of this issue. General Chennault has been fighting the Japanese air force since 1937—as aviation advisor to the Chinese government, organizer and commander of the American Volunteer Group, chief of the China Air Task Force and CG of the 14th.

"**FLIGHT STRIPS,**" the Army Air Forces' practical solution to the landing area problem, have become a definite factor in wartime operations. Long regarded as the "father of the 'Flight Strips' program," Colonel Stedman Shumway Hanks has taken a leading role in the development of the projects which have been set up not only in more than a dozen States but up along the vital Alcan Highway to Alaska. On Page 8 Colonel Hanks presents a progress report on the wartime significance of "Flight Strips" and explores several post-war considerations.

IF YOU'VE ever wondered what would happen to you if your bomber exploded in mid-air over enemy territory, you might be interested in the story on Page 12 which relates the experiences of Captain Frank P. Bender who had just that happen to him over Buna when that section of New Guinea was in Jap hands. His trying ordeal in reaching his base makes Captain Bender's survival story not only spectacular but highly informative. Captain Bender, who is now A-3 of a Bombardment Wing at Drew Field, Tampa, Fla., saw action in the Philippines and Java as well as in New Guinea.

TWO OFFICERS and two enlisted men recently returned from the Aleutians have given Herbert Ringold of the AIR FORCE staff a graphic description of what it means to fight Japs and weather in the northern theatre. Their story appears on Page 14.

THE AIRWAYS TRAFFIC CONTROL organization, key to the network of airways leading pilots safely "on course" throughout the United States, has never been clearly understood by many of our airmen. With

this in mind, Lieut. Colonel George C. Price, chief of staff, Flight Control Command, has written an article for AIR FORCE on the organization of Airways Traffic Control, how it works and the plans underway for the future. Colonel Price's article appears on Page 22.

ONE OF THE MOST devastating raids yet made on a vital Japanese industry by AAF bombers was that which blasted enemy phosphate plants on Nauru Island in mid-April. A picture story of the raid, which was led by Major General Willis H. Hale, Commanding General of the 7th Air Force, is presented on Pages 24 and 25. The front cover this month shows an important step in the preparation for this raid.

THE JAPS don't like our B-26s and Major Dill B. Ellis tells why in his story on Page 30. Major Ellis returned to the United States recently after flying numerous missions against Jap installations as CO of a B-26 squadron in the South Pacific.

EVEN in the first World War, an important intelligence factor in determining enemy positions and mapping new advances was the use of third-dimensional photography by means of the stereoscope. The latest development in the field of third-dimensional photography and interpretation is the Vectograph, which permits entire groups to view pictures and mosaics of enemy territory simply by using polarized spectacles. Lieutenant Colonel M. E. Parks describes this new method and its many military uses in the article on Page 32. Colonel Parks is a technical advisor on techniques of photogrammetry and photographic equipment and development at Headquarters.

YOUR AIR FORCE this month has had a shave. The margins have been reduced and the format trimmed to afford readers more type and illustrative matter per square inch and, at the same time, conserve the paper required for each page of the publication. This trimming is accompanied by an increase in pages—from forty to forty-eight—to permit your service journal to keep pace with the expanding activities of the Army Air Forces. The increase in pages also is in keeping with numerous requests from readers for a larger publication.

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CROSS COUNTRY

The manpower conservation program, and other developments of the month within the Army Air Forces.

ARE general service men at your station being used in post headquarters work, as runners and messengers, on orderly room clerical detail, for policing grounds and buildings, as motor vehicle drivers and maintenance men, as officers' mess attendants?

Official reports indicate that a large percentage of the housekeeping and service jobs at Air Forces installations in this country can be done by personnel other than those classified for general service duty— limited-service officers and enlisted men, WAACs and civilian women, and male civilians over military age or those permanently deferred.

How many officers and enlisted men in the Army Air Forces are engaged in unnecessary jobs at stations within the continental limits? How many are performing duties for which they are not suited? How many units are overstuffed for the particular job they are performing? How can officers and men in such jobs and units be made available for transfer?

The answers to these questions, and others like them, are now being developed. The best, we are told, is definitely on. In brief a manpower conservation program is under way in the Air Forces.

The program is being directed by the newly created Manpower Division, which operates under the Chief of Management Control at Headquarters. The program in the Air Forces is part of a general War Department effort, supervised by the War Department Manpower Board, to put the right man in the right job and accomplish a reduction in military personnel engaged in non-combatant activities.

Here's a statement from the AAF Manpower Division:

"The job is two-fold: to eliminate excess manpower--both military and ci-

vilian—at continental installations; and to fill as many of the remaining jobs as possible with limited service men, WAACs and civilian women, and over-age or permanently deferred males."

Obviously, a small Headquarters unit like the Manpower Division can't carry out the entire manpower conservation program in all commands of the Air Forces. Its main job is to aid in initiating studies in the commands, generally monitor the manpower surveys, analyze results and make recommendations. Surveys at selected stations will result in the establishment of ground rules, yardsticks and standards for the over-all program.

Where possible, "Exact Manning Tables" will be employed as a basis for personnel requests in place of Tables of Organization. Adoption of an Exact Manning Table means a complete and objective survey of an installation to determine the exact number of personnel required, rather than the allotments of personnel by squadrons or other group units.

Other factors involved include the elimination of unnecessary and/or duplicating reports, elimination of non-essential and the curtailment of over-expanded activities, and simplification of administrative practices and procedures.

ANOTHER CHUTE MISSING

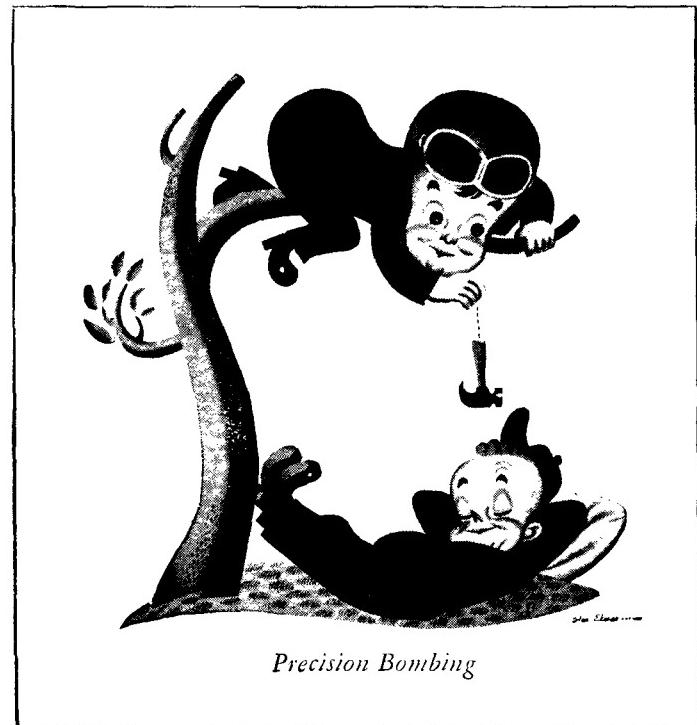
Base Operations, Army Air Forces Proving Ground, Eglin Field, Florida, reports a missing parachute, Type S-1, No. 42-63129. If you locate it, please return the chute to Base Operations at Eglin.

HANGAR OF FAME

A letter from First Lieutenant L. A. Hamilton, Tactical Officer of the Aviation Cadet Detachment at Brooks Field, Texas, tells of a special use at his station for the AIR FORCE "Roll of Honor." A "Hangar of Fame" is kept at that advanced flying school, listing all its graduates who have been decorated. So far, he writes, sixty names have been gleaned for the Brooks Field "Hangar of Fame" since AIR FORCE began its "Roll of Honor" feature. This is one convenient method by which training schools can keep track of their alumni who distinguish themselves in combat.

"AS TIME GOES BY"

A Hollywood "idea" man suddenly found himself in the Army, stationed as a private at a West Coast base. It wasn't long before he had developed what he thought to be the answer to the Army's prayer. The next step, of course, was to



Precision Bombing

get the idea before proper authority. Laboriously he sold his brainchild through channels. Then the great day arrived and he was standing before the Colonel, a tough old compaigner. Our hero, using his best Hollywood technique, employed "terrific," "stupendous" and "colossal" with abandon. The Colonel sat unmoved. Finally, his presentation over, the Private paused for breath. It was the Colonel's move. Said he: "That idea has merit, young man. Come back and see me in six months." The Private didn't blink an eyelash. With military precision he raised his arm and stared at his wrist. "Shall we synchronize our watches, Sir?" he asked.

MULLET KEY

Perhaps the most bombed and strafed group of men in the continental United States is a detachment of Army Air Forces personnel on Mullet Key, Florida.

Mullet Key lies about thirty miles off Tampa. A strip of sand, palms and beach about three miles long, it is used as a bombardment and ground strafing range. Virtually 24 hours a day, medium bombers from MacDill Field and Sarasota and fighters from the 3rd Fighter Command at Drew Field raid this peaceful island, while on a tall flagpole a red-orange flag, hung below the stars and stripes, warns ships in the vicinity to keep well away from there.

The detachment is from the 97th Aviation Squadron at MacDill Field. It is under the command of First Lieutenant R. G. Gilliland. The last we heard there were two white soldiers—Privates First Class Robert Koch of the Medical Detachment, Base Hospital, and James Manwell, a mechanic—all the rest, Negro troops.

This detachment maintains the range, keeps and reports scores from spotting towers, repairs the bulls-eye panel targets which line the beach, operates the radio, and performs other duties of a regular post. Retreat is an impressive little scene.

Facilities of the island consist of only three or four white clapboard buildings and a dock. However, the unit boasts the "smallest PX in the Army"—a large packing case with a lock on it, from which toilet articles and other supplies are sold. It does a business of about \$150 a month.

None of the soldiers has ever been hit, although Lieutenant Gilliland admits that "some of the flyers are a little wild." They "can scare you a little, but never hit real close."

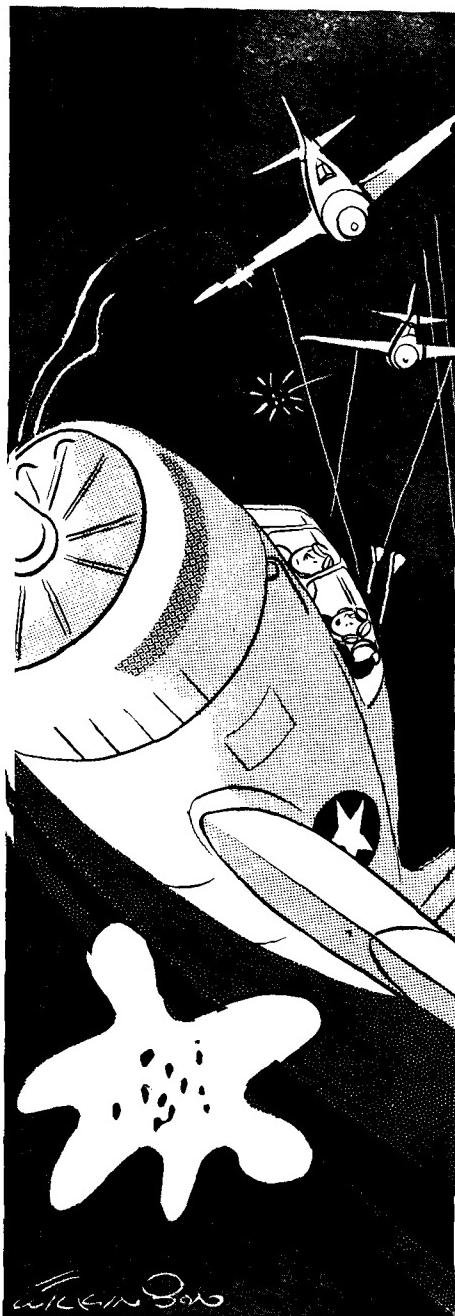
Morale on the key is as high as you'll find anywhere. For example, while the men can have frequent two-day passes into MacDill and Tampa, they practically never take them, even when urged by Lieutenant Gilliland, and their only worry is that they'll be transferred. The reason—swimming, fishing, volleyball and so

ball are all good on this clean white strip of sand and the weather is pleasant. The food is said to be absolutely tops. And the job is an important one in a country that is depending heavily on its ability to train first-rate combat airmen in a minimum of time.

AUTOMATIC NAVIGATOR

An automatic navigator that will make practically all computations for the navigator thereby greatly simplifying dead reckoning and eliminating some instruments is one of the latest products off the Wright Field engineering line.

Three indicators on the device continuously give air mileage, latitude and longitude. Having set the mileage meter at zero at the start of a mission, the



"Scare me—I've got hiccups!"

—FRITZ WILKINSON

navigator has only to take off readings during the flight to stay on course.

An averaging sextant further aids the navigator in establishing his position by celestial observation. It will record and average 100 readings of stars and planets in two minutes, virtually eliminating chance error due to speed, vibration and rough air. With the astrograph, the aerial navigator can fix his position on a chart (using the sextant readings) in one and one-half minutes.

DOCTORS OF BOMBARDIERING

From the Midland Army Flying School come reports of the outstanding success achieved by former college pros and public school teachers, who were rounded up to staff the ground school classes at this bombardier "college" when instructors were needed in a hurry. These trained teachers, beyond the age of maximum combat efficiency, offered a double solution—not only could they cut the mustard from the teaching angle, but also their utilization relieved younger men for flight instruction and combat duty.

In finding a direct connection between a schoolmaster and a blockbuster, their previous unfamiliarity with bombardiering did not hamper them in the least, so we hear. It was a neat jump—from music, economics, history and chemistry to theory of bombing, fuses, analysis of results and automatic pilot operation. Of course, the teachers first went through the entire bombardiers' course, including the actual bombing of targets on the practice range.

The teachers are said to have found no important differences between instructing aviation cadets and college students, except that they say the cadets are more eager to learn and discipline is more rigid.

One exception. A former University of Wisconsin prof confesses, "We miss the co-eds."

MIX-UP IN PHOENIX

It is told around Phoenix how Chinese cadets who came to Arizona for flight training earlier in the war unwittingly threw a scare into the citizenry. The first time the Chinese students went into the air and used their radios, they began to talk to each other over the interplane sets. Naturally, they spoke Chinese. When it was heard on the airwaves by civilian stations and others around Phoenix, it very nearly caused an alert in the city against what many thought to be a Jap invasion.

PILOT'S TEN COMMANDMENTS

In the columns of "The Flyer," publication of the Reno, Nevada, Army Air Base, we found "A Pilot's Ten Commandments." Here they are:

1. Seat thyself well upon thy fifth vertebra, leaving not thy fingerprints on the

AIR FORCE, August, 1943

controls, and chewing not on thy fingernails.

2. Know thy instruments, for they are the true and appointed prophets.

3. Follow the indications of thy instruments, and verily the airplane will follow along, even as the tail follows the sheep.

4. Do not stick out thy neck a foot; stay within the confines of thy ability, and thou shalt live to a happy old age.

5. Know the appointed words and approved methods; so if thy neck drapeth out thou shalt be able even unto thyself to place same in its proper place, upon thy shoulders.

6. Follow thy radio beam; for their ways are the happy ways and will lead to the promised land-ing.

7. Listen carefully, yea verily, to the signal impinging on thy eardrum, for sometimes they seem to have the tongues of snakes and will cross up thy orientation, to the sad state to where thou must ask Heaven itself for guidance.

8. Assume not, neither shalt thou guess, that thy position is such, but prove to thine own satisfaction such is the case.

9. Boast not, neither brag; for surely Old Devil Overcast shalt write such words in his book, and thou shalt, some day, be called for an accounting.

10. Trust not thy seat (of thy pants) but follow thy instruments; read and truly interpret the word as given from thine instrument board; know that the responsibility lieth not with the hand that rocks the control column, but in the mind that directs the hand, and thou shalt be blessed with a long and happy life.

CEILING ZERO MINUS

Sailors in the Army are nothing new. The Army operates many kinds of boats for one purpose or another and they are manned by Army personnel.

But under-sea divers in the Air Forces are rare. So far as we know, there are only six of them. They are under the command of a Navy warrant officer but are personnel of the First Proving Ground Torpedo Squadron at Eglin Field, Florida, where medium bomber crews are trained in the technique of torpedo attack.

It is the function of these divers, who have full under-sea equipment and a special boat of their own, to go out to sea during practice runs, mark the places where the torpedoes sank, and later retrieve them.

DAMN THE TORPEDOES . . .

Back in the April issue we carried an article by Captain Charles D. Frazer, entitled "Night Mission Over the Caribbean," in which the author described a submarine hunt in a B-18. At one point, quoting the bombardier of that plane, the article states:

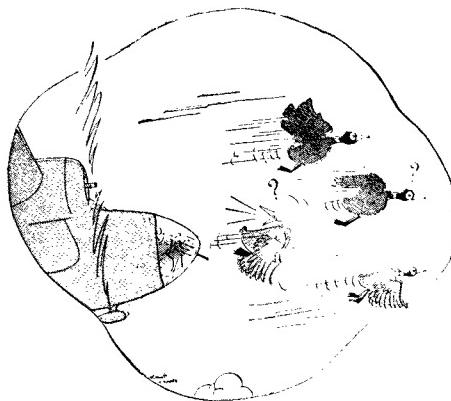
"The best time to catch (a submarine) is when he's filling his torpedo tubes. He can't dive until his tubes are closed and

that gives you a little bulge on him. If he's only charging batteries, he can crash-dive on you."

We're indebted to Captain Ray D. Tarbuck, U. S. Navy, Naval Liaison Officer at the AAF Navigation School, Selman Field, Alabama, for checking that statement. Writes Captain Tarbuck:

"In the Department of Naval Forces and Operations at Selman Field the students learn that submarines do not come to the surface at all to refill torpedo tubes, because it is accomplished by breech loading within the vessel. We also teach that torpedo tubes open or closed cannot deter diving since the interlocks make it impossible to open both ends of the tube at the same time."

A checkup reveals the point in question to be worthy of further discussion. Based on information received from AAF Antisubmarine Command Headquarters, our reference to the filling of torpedo



"Scram, boys—I heard him say he's going to feather his props!"

—CPL. PAUL J. KAATZ

tubes is open to misinterpretation since there are two procedures involved in this connection: First, the actual filling of the tubes; secondly, the loading of the torpedo room with torpedoes from the deck container after the torpedoes in the room have been utilized in attacks at sea.

The Command informs us:

"The description of operation concerning interlocking of chambers and loading within the vessel concerns only the single operation of loading the tubes. But when the torpedoes are used up within the room itself, then the only place remaining to obtain more projectiles is from the deck container where spare torpedoes are kept. To reach the deck container it is necessary for the submarine to surface completely; the hatch on the deck must be opened and a hatch in the pressure hull directly beneath the deck hatch must be opened also. Cranes are wheeled into position for removing the deck torpedoes to the torpedo room immediately below. It is believed that this operation requires about two to four hours in a Nazi submarine. But, this operation is performed only once during an entire voyage lasting sometimes two

to three months. Battery charging is almost a daily occurrence under average conditions. Of course, if a sub is caught with its hatches down, so to speak, the time taken to batten the hatches is many minutes before a dive is possible. Hence, in this instance of opening the hatches once in two or three months' time, the sub is caught at greater disadvantage than during the battery-charging operation, which is much more frequent."

From this we conclude that there would have been no chance for misinterpretation had the bombardier's statement been: "The best time to catch one (a submarine) is when he's filling his *torpedo room*. He can't dive until his *hatches on the deck* are closed and that gives you a little bulge on him. If he's only charging his batteries he can crash-dive on you."

BLACKOUT

As this story has it, the co-pilot of a transport was making his virgin trip over a northern run. Suddenly, at 18,000 feet, he realized that his vision was getting blurred. He had but one thought—anoxia! The co-pilot hurriedly checked his mask. No leaks. He checked the regulator. It was okay. But still it grew darker. Frantically he turned to the pilot, and found him totally undisturbed. When our co-pilot felt himself about to blackout completely he prepared to gasp into the intercom for help. But before he got the chance he heard the flight engineer's voice come in: "Damn, this is the first total eclipse I ever saw!"

A BOMBARDIER SAYS

Now and then, everything on a bombing mission goes along as nice as pie until it's time for "Bombs away" and then no bombs drop out.

Technical Sergeant John O'Brien, a veteran B-26 bombardier with more than twenty combat missions over the hottest spots in the Southwest Pacific to his credit, follows up that comment with a few others.

He feels that if a bombardier wants to make sure his bombs are dropped correctly, he should first make sure they are loaded correctly. He admits that sometimes it is impractical to watch personally the bombs being loaded into the rack, since this is often done while the mission is being briefed. But whenever possible, the bombardier should be on hand for this operation and not only know what is being done but exactly *how* as well. Before loading, the bomb rack should be run through two or three times to see if it is functioning properly. The bombs, he says, are ultimately the bombardier's responsibility and he should know everything there is to know about them. In this knowledge he includes the setting of the fuse and the ability to change the setting of the fuse in flight, because occasionally the original target, which

SNOW, SAND & SARONGS

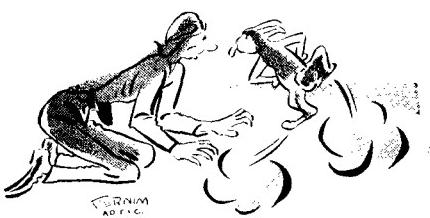


TIPS FROM THE ARCTIC DESERT AND TROPIC INFORMATION CENTER

PHANTOM ICE. Alaskan flyers have reported several cases of wing-icing in apparently clear air. Theoretically, this isn't possible since visible moisture in the form of subcooled water must be present to form wing-ice. AAF pilots encountering a condition producing wing-ice in apparently clear air are requested to report the following details to the nearest weather office: (a) condition of the sky; (b) temperature; (c) altitude; (d) looking at the sun—ice crystals or halo or both.

ARAB APPEAL. "Blood chits" are now carried by our pilots on all missions over North Africa. These are written in three languages and are intended to secure the friendship and the aid of the Arabs. They're as good as money because the natives can cash them in as a reward for helping our airmen to safety.

KITCHEN SINK. American airmen in the Pacific area have found a fascinating study in bits of shrapnel picked up after a Jap raid. Some of the fragments are easily recognized as American in origin—nuts, bolts, scissors from a well-known sewing-machine maker, pieces of farm machinery, even two first-class radiator caps. The boys are looking for the radiators in the next raid.



JACK SPRATT. In Arctic regions, you can literally "eat yourself to death." There are numerous entries in the North country log about men who've eaten hare to bursting and yet lost weight day after day. Hares have little fat content, and fat is a vital part of the Arctic menu. If you're ever faced with a forced hare diet, be sure to garnish your banquet with seal or walrus blubber (or any other similarly delightful fat equivalent).

The Arctic, Desert and Tropic Information Center welcomes contributions from all Army personnel with knowledge of the non-temperate theatres of operation. Submit to: Arctic, Desert and Tropic Information Center, Eglin Field, Fla.

FICKLE STORMS. In the Bismarck Sea engagement, the Nips had counted on an overcast similar to that which permitted the *Gneisenau* and *Scharnhorst* to escape through the English Channel. They expected an existing tropical disturbance to afford cloud cover for operations for at least five days. During the nights of March 2 and 3, however, the storm suddenly reversed its direction and made the armada look like sitting duckpins. Flying and bombing weather is at its best after the passage of a tropical storm.



JEEP JAUNTS. The inventor of the jeep must be pop-eyed by now at the legends and deeds of his famous brainchild. But this latest one tops them all. New pastime for the boys in North Africa is shagging gazelles in a jeep, thereby solving the fresh-meat shortage and proving that the age-old saying "as swift as a gazelle" just means second gear as far as a jeep is concerned.

DID YOU KNOW . . . that a plane flown continuously on a course of N. 45° E. (true bearing) from New York, will eventually arrive at the North Pole . . . that Fairbanks, Alaska, is equidistant from Washington, D. C., Tokyo, and Murmansk, Russia . . . that the lowest temperatures ever recorded have been found south of the Arctic Circle?

DESERT STATIC. To overcome the hazards of static electricity under desert operating conditions, the nose wheels of the P-38 and P-39 and the tail wheels of the P-47 and P-35 are now equipped with static inductive tires having a graphite base. These tires do away with individual conductor wires. After the war, they might be made available to college boys parked in Lovers' Lane on moonlit nights.

called for a setting of ten seconds delay, will be closed up and another, requiring an instantaneous setting, will present itself.

O'Brien also warns against careless handling of the bombsight, which can't be tossed around like a football. An accurate time check should also be kept and the bombsight sent into a depot when the time is up. A bombardier should develop skill in adjusting quickly to new altitudes and in instantly setting up different dropping angles in addition to knowing sight settings so well he can make a set without constantly referring to his bomb book.

Finally, O'Brien advises bombardiers in medium bombardment outfits not to get itchy fingers just before the run starts. Wait until the pilot calls "level and on course," then go to work, says he.

A "HERO" COMES HOME

Everyone expects modesty in a returning hero. When the home-town folks turn out in celebration, a hero is supposed to blush and stammer, reluctant to admit his bravery and exploits. That's why they wouldn't believe Private First Class Ora G. McClain.

Private McClain, after a knee operation that had no more to do with combat than a game of golf, received a two months' furlough early in March and departed for his home town of Greenville, Ohio. Wearing the red, white and blue ribbon, indicative of foreign service in the Western Hemisphere, and hobbling on crutches, he soon found himself the center of attention.

They stared pop-eyed as he got on the train for St. Louis. Beautiful girls and motherly women found excuses to engage him in conversation. The men regarded him with envy and admiration.

Private McClain tried to disillusion them but couldn't get to first base. After all, wasn't he an overseas veteran? Yes, he was, with a ribbon to prove it. And those crutches! He looked just the type—self-conscious in civilized surroundings after those days and nights of bitter struggle with a knife in his teeth and a bullet in his leg, coolly facing a cruel, ruthless, cunning, relentless enemy.

"But I tell you I wasn't in action," pleaded McClain. "I haven't been within five thousand miles of an enemy bullet. The reason I'm wearing these crutches is that I had to have an operation on my knee. It was a busted cartilage."

"A cartridge! A cartridge! You hear that, folks?" cried an excited man. "He was hit in the knee by a cartridge."

"No, no," said the embarrassed private. "It was a cartilage. It got floating around and giving me trouble so the medicos cut the knee open so I could have it dug out."

"It happened in a dugout," said someone in the rear of the crowd. "Must

have been a shell fragment. Got one in the elbow myself at Chateau Thierry."

"Please, please, don't misunderstand," begged McClain. "I don't want anyone to think I'm a hero when I'm not. I haven't seen a minute of action yet."

To complicate matters, a Marine, loaded down with a Japanese rifle and helmet, got aboard and immediately came over to visit, further convincing everyone in the car that the trophies actually had been captured by our Private McClain.

And so, on and on it went until they reached St. Louis. In the crowded Union Station there, police and gate guards cleared a path through which the discomfited AAF soldier hobbled in triumph. Servicemen and civilians alike stepped aside, and from all around came cheers and benedictions.

"God bless you, son," "Hip, hip hooray," and "We'll blow those monkey-faced Japs into smithereens," were some of the shouted messages. But by this time he had given up trying not to be a hero. He found it easier just to relax. So he bowed, smiled and waved in all directions to the roaring delight of the throng.

But finally he found someone to believe him. It was when he reached home. His wife. But of course she probably thinks he's a hero anyway. (Our thanks for this one to Captain Richard D. Grant, 6th Air Force.)

GOOD NEWS FOR PROSPECTIVE FATHERS

The Children's Bureau of the United States Department of Labor is making grants to public health agencies of the various States in order to provide medical, nursing and maternal and infant hospitalization for the wives and children (under one year of age) of enlisted men of the seventh through the fourth grades, irrespective of legal residence or financial status.

Application forms may be obtained from State and local health agencies, home service of local Red Cross chapters, prenatal clinics, other community agencies and physicians. The form must be signed by the enlisted man's wife and by her attending physician. It is necessary that the husband's Army serial number is included.

CLUB NOTES

Our editor in charge of the Keeping-Track-of-New-Clubs Department comes forward with fraternity news. Recently organized in North Africa among airmen is the "Point Snorkers." This new society imitates to a certain extent the "Short Snorters" in the use of a membership card, but instead of a dollar bill the "Point Snorkers" carry a five-franc Algerian note. It is furnished by the candidate for membership himself, after he has proved his eligibility by growing a mustache which points toward his ears. Once a member, a snorker cannot remove

the lip adornment unless by order of higher command or upon return to the States.

Failure to produce his membership card when asked to do so by a brother snorker results in the careless member forking over five francs to all members in the immediate vicinity.

Our editor in charge of the KTONCD passes on the further tidbit that a snorker's mustache must be of such dimensions



Emblem of the "Goldfish Club" (below) is worn by RAFFers who've had to swim for their lives. "Late Arrivals Club" members display the boot above, signifying they have returned to base on foot from a mission.



that it can be clearly seen from a distance of 100 feet. Major Charles R. Greening is Chief Doozer and other charter members, all members of a medium bombardment group, are Majors Farrell L. Bowen and Marius P. Hanford, First Lieutenants Lee E. Romine, Jack E. Ryan, William R. Kemp, John E. McClure and George Beall, Master Sergeant James J. Flanagan, Technical Sergeant Harvey J. Belser, Staff Sergeants Ferdinand A. Watson, Jr., Maurice A. Davis and Herbert L. Sanders, and Sergeant Philip C. Croyle.

Then we have club news from the

RAF. Newest with them, we hear, is the "Goldfish Club," made up of those who have had to swim for their lives or put in "dinghy hours," as they say. This outfit has a fancy badge, portraying a white-winged goldfish on a black background skipping over two blue waves. It's worn over the right pocket of the battle dress or under the lapel of the regular blouse —like a detective's badge. The first member to bring the smart emblem of this quaint society to this side of the pond was Flight Lieutenant Johnny Tett, RCAF navigator attached to the RAF, who recently returned from two years' overseas service. He also holds membership in the ancient "Caterpillar Club" and the newer "Late Arrivals Club," to which membership is gained by returning on foot to base from a mission. The winged boot of the "Late Arrivals Club" and the emblem of the Goldfish Club are pictured here.

COLLEGE CREDITS EXPLAINED

If you go back to school or college when the war is over, you can receive full academic credit for educational work taken while in the Army.

Upon completion of a correspondence course with the United States Armed Forces Institute, the Registrar will have a record of your achievement. If you finish a training course at a training school, your record can also be placed on file with the Institute. And if you enroll in a voluntary, off-duty class, you can take a special examination and have the results placed on record. The Institute will send your entire record to any school, college or employer requesting it.

For enlisted men who do not take advantage of the Institute's educational services, an opportunity is offered to take an educational maturity test. This is a survey of your general knowledge, designed to discover what you have learned during your military service which may be of value in formal school work. These tests will be administered upon request, the results recorded with the Institute, and reported to schools and colleges as evidence of educational maturity. This evidence will serve as a basis for assignment of academic credit.

The tests for use at the high school level will consist of comprehensive objective examinations in each of five major fields of educational development, including correctness and effectiveness of expression and the ability to interpret reading materials in the social studies, or the natural sciences or literature. A test of general mathematical ability will also be given.

A similar but more difficult range of tests will be established by their tryout with groups of high school seniors and college freshmen. Separate standards will be fixed for schools in different geographical regions and of different types and sizes.—THE EDITOR.

IS OU

(An early assignment for new pilots of the 14th Air Force in China is a talk with their commander, General Chennault. Here, in part, is what he tells them.)

FLYING in China is different from anything you have ever done. Your training has been good, but you have a lot more to learn. It will take at least another twenty to thirty hours in the air out here before you are ready to fly missions.

Your first problem is to learn how to find your way around China. Getting lost over China is a simple matter. Most terrain patterns look alike. It is almost impossible to tell one valley or mountain range from another. Rivers, terraced rice paddies and villages all look alike. There are few landmarks and fewer names on Chinese maps that can be readily recognized. Roads and railroads are scarce.

Weather changes rapidly and violently. You can seldom fly for 100 miles without encountering a weather change. Under these conditions pilotage is almost impossible. Much of your flying will be on instruments, and you must rely entirely on radio and compass for navigation.

If you get lost don't waste gas flying a straight course. The minute you get into trouble circle for five minutes. We have a radio reporting net that will pick you up and give you a course to the nearest base. This net extends throughout China and also gives us weather reports and air raid warnings. The Chinese people have been well trained in the operation of the net. It has functioned well for several years. When you get into trouble you can depend on it.

Scores of our planes have been guided safely home by the net. Many of our men who have been forced down have been found by operators of the system. If you make a forced landing, don't wander away from your plane. The net will report your landing and dispatch friendly Chinese to find you.

In combat you are part of a team. Never forget that. Teamwork is the basis of all our tactics and one of the principal reasons for our low losses. Our fighter tactics are based on the fact that two planes working together are more effective than three or four planes fighting as individuals. My men have fought against odds of five and ten to one with these tactics and won consistently with small losses. They have been proved in battle and the Japanese don't like them.

Our bombing missions call for even more teamwork, precision and air disci-

BATTLE PLAN

By Maj. Gen. Claire L. Chennault

COMMANDING GENERAL, 14TH AIR FORCE

pline. Day bombers never go out without fighter escort. We have worked out a system of escorting bombers that makes it impossible for Jap fighters to get at our bombers without first tangling with our fighters. This gives our bombardiers the time and security for deliberate and accurate runs over the target. As a result, our targets take a beating and we seldom lose a bomber.

You must use the strong points of your equipment and deny the enemy the advantages of his equipment. Each type of plane has its strong points and weaknesses. The pilot who can turn his advantages against the enemy's weakness will win every time. You can count on a higher top speed, faster dive and superior firepower. Japanese planes have a faster rate of climb, higher ceiling and shorter radius of turn.

Japanese fighter planes were built for turning combats. If they can get you into their kind of fight they are deadly. Use your superior speed and faster dive to make a pass at your opponent, get in a quick burst and then break away. You have the edge in that kind of combat. All your advantages are brought to bear on the Japanese deficiencies. Never get into a long continued turning combat.

You need to sharpen your shooting eye. Nobody ever gets too good at gunnery. The more Japs you get with your first bursts, the fewer are left to jump you. Accurate gunnery saves ammunition. Your plane carries a limited number of bullets. There is nothing worse than finding yourself in a fight with empty guns.

You will face Japanese pilots superbly trained in mechanical flying. They have been drilled for hundreds of hours in flying precise formations and rehearsing set tactics for each situation they may encounter. Japanese pilots fly by the book. They have plenty of guts but lack initiative and judgment.

They go into battle with a set tactical plan and they stick to it. Their bombers will fly a tight formation through the toughest pursuit as precisely as though they were in an air show over Tokyo. Their pursuits always pull the same tricks. God help the American pilot who tries to fight them according to their plans.

The object of our tactics is to break their formations and make them fight according to our style. Once the Japanese pilot is forced to deviate from his plan,

he is in trouble. They lack the ability to improvise and react instinctively to new situations. Their rigid air discipline can be used as a strong weapon against them.

The Japanese pilots you will face over China are only slightly less skilled than those we fought two years ago. The Japanese seem to have speeded up their training program to meet the demands of combat. As a result, their newer pilots lack the polish of the older China veterans.

All Japanese pilots are good gunners. They use deflection shots almost exclusively. However, their guns don't have the range or destructive power of American aerial guns. The Japanese 20 mm aerial cannon is heavier than any of the guns we carry out here, but it lacks the range of our .50-caliber machine guns due to a low muzzle velocity. Japanese aerial armament is generally not effective at a range of over 200 yards.

Japanese planes are still made from good materials, but the workmanship is not up to the standard of the materials. The light materials that give enemy planes their maneuverability also make them hard to maintain. The light parts won't stand repairs. Even slight damage will put a plane out of commission. They don't hold up under heavy fire.

Our planes can take a beating and still

be patched up to fly and fight again. Many times the ruggedness of our airplanes was all that kept us in the fight.

China has been at war for six years and Chinese pilots have been in the battle from the beginning. Some of these veterans will be fighting with you in American planes. Other Chinese pilots have received the same training in American flying schools as you did. They are good pilots and do their job well in battle.

In the early days of the Sino-Japanese war the Chinese pilots fought Japanese bombers to a standstill as long as their planes lasted. Over Nanking in 1937, they shot down 42 bombers in two weeks while losing only six of their own planes. They forced the Japs to try night bombing and then, with only a week's training in night flying, they went up as night fighters and stopped the new Japanese assaults. One Chinese pilot got three bombers on his first two night flights on consecutive nights.

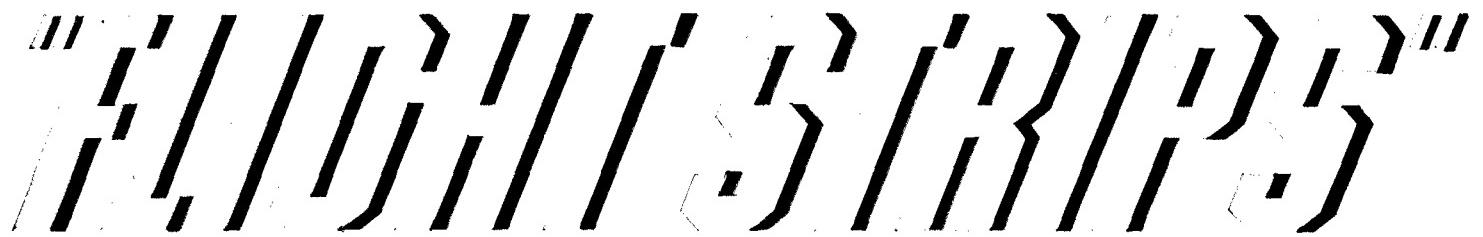
Chinese pilots were the first to fly over Japan and the first to raid Formosa. They did that in 1938 with Martin B-10 bombers. Chinese pilots have plenty of nerve and are superior to the Japanese in individual combat. They have better judgment and headwork in rapidly changing situations. The Japanese are better in formation work.

Six years of invasion have sown bitter seeds of hate in China. The Chinese will never stop fighting until the Japanese are driven from Chinese soil. One of the reasons for China's resistance to the Japanese lies in the fact that every Chinese has something he considers worth fighting for. Even the poorest coolies with only a dirt mud hut will fight to keep it. You can never conquer a nation like that.

And that's something for you to remember. ☆

AIR FORCE IN CHINA, Lt. Col. Robert Morgan, Major Gen. Claire L. Chennault, Col. Robert L. Scott, Jr., and Col. William E. Purdy brief their planes on their goals for a bombing raid in a last-minute field conference.





FOR WAR AND PEACE

By Colonel Stedman Shumway Hanks

PROJECT OFFICER FOR 'FLIGHT STRIPS,' ARMY AIR FORCES

A NUMBER of unassuming but important patches of concrete have appeared since the start of the war in the countrysides of more than a dozen States and up along the Alcan Highway to Alaska.

These are "Flight Strips"—the Army Air Forces practicable and workable solution to the problem of developing properly located and adequately maintained landing areas.

The "Flight Strip" program has definitely progressed beyond the experimental stage. I state that with meaning. It has been my good fortune to act as Project Officer for the program since its birth and to have followed it closely, step by step—or inch by inch—ever since. So often have I discussed it in the future tense that it is a pleasure to report on actual accomplishments and on what experience has shown regarding future possibilities.

Now it can be reported that the "Flight Strip" program has surpassed our fondest expectations. Moreover, I have reason to believe that it will prove to be one of aviation's most far-sighted developments.

First and foremost is the wartime utility of "Flight Strips" in this country. "Flight Strips" today are being used by the Army Air Forces in several aspects of flight training, in tactical operations including the dispersal of military aircraft, in anti-submarine work, in the ferrying of aircraft and the transport of cargo. They have proved suitable for glider operations. They will be used as auxiliary fields in connection with the standardized control of military aircraft. And they have a special role in the air defense plans for this country.

All this is in addition to the use of "Flight Strips" as emergency fields. That the "Strips" are attaining our original objectives is evident from the reports being received.

Even before they were finished, at every "Flight Strip" site on the West Coast and in the Middle West where it was possible

to land on a shoulder, planes came down on the "Strips" when it was impossible for them to reach their objectives because of bad weather or lack of fuel. The planes included a P-38 in Oregon, a Navy single-seater in Arizona, a Douglas transport in California. More than once our "Strips" have prevented bail-outs.

Dozens of emergency landings have since been made on finished "Flight Strips." The case of the B-25 that encountered storms while flying up the East Coast was typical. The pilot was headed for Langley Field, Virginia, but an extremely low ceiling shut him out from that airport. The home field at Dover,



Delaware, was also closed in. The pilot found that a 500-foot ceiling existed over a Virginia "Flight Strip," and brought the plane safely in to this landing area.

Perhaps the best working example of wartime use of "Flight Strips" can be found along the Alcan Highway to Alaska, under an agreement between the governments of the United States and Canada.

"Flight Strips" have for several months been in use along the Alcan Highway, and the entire "Flight Strip" program for the Highway is just about completed. They form the first chain of international landing areas.

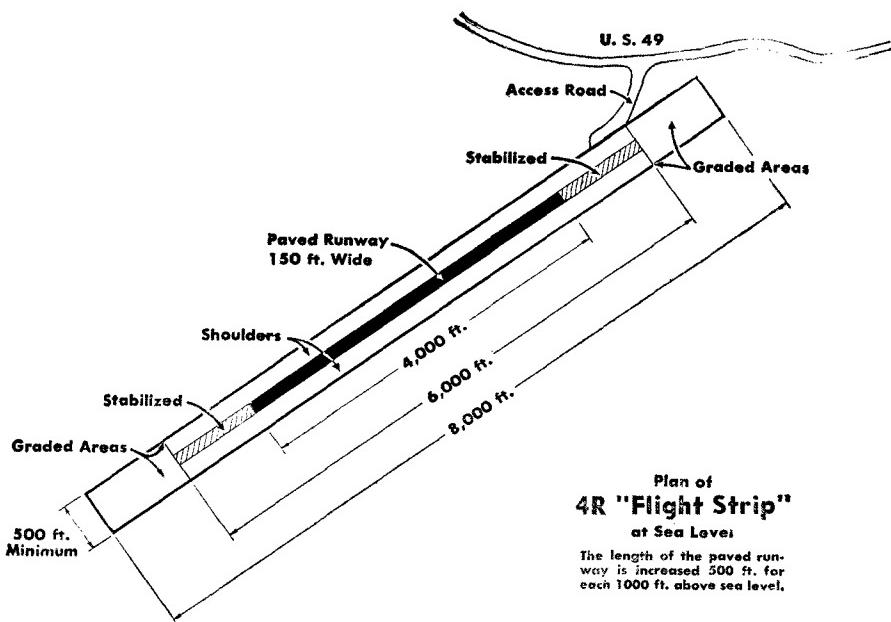
Because of the precedent that has been established, and because the program as it applies to the Alcan Highway illustrates the newest development in "Flight Strips," it might be well to go into some detail on this phase of the operations. To begin with, it is essential to understand some of the background.

THE Alcan Highway, basically, was developed as an overland route to link aircraft landing areas and not, as is generally supposed, an out-and-out truck supply route. The need for a series of landing areas from the United States to Alaska was realized years ago, and by no one more definitely than by General Arnold, our Commanding General, who in 1934 led a flight of B-10 bombers to Alaska.

General Arnold thought in terms of "Flight Strips" and instructed me to explore the possibilities of placing such "Strips" in Canada. But the Canadian government, which governed selection of the highway route, preferred to select sites for airports and to develop existing airports and build others instead of "Flight Strips." Finally the Corps of Engineers was instructed by the President to connect the Canadian airports by a road so supplies and equipment could be sent along the route.

At this point it might be well to mention the unheralded but important place aircraft and airmen have played in the construction of the road itself. Under the pressure of speed, normal road-location procedure—thorough ground reconnaissance and elaborate survey and staking work—generally had to be dispensed with. The use of aerial photographs proved to be the answer. Also, pontoon-equipped observation planes proved to be ideally suited for the early reconnaissance work.

Due to the difficulty of making surveys and locating the route, airplanes flew engineers, supplies and equipment ahead of the actual road construction. Camps were set up and the engineers began building trails in both directions. By establishing such camps by airplane along the proposed route, it was possible for construction parties to begin building the highway at many different points along the route. In all cases, the camps were



How these new type landing areas have gone to war, in this country and along the Highway to Alaska; and some post-war considerations.

supplied by plane with food, personnel and mail and miscellaneous equipment.

Then, too, the airplane was essential in case of emergency. Last fall, for instance, along the Alcan route an enlisted man had a ruptured appendix. With all other transportation facilities closed out by weather, there was no way of saving his life except by flying in medical aid. Two Army doctors were flown in to a nearby "Flight Strip." Trucks on the road lighted up the "Strip" so the pilot could land. The doctors performed the operation, the man's life was saved, and the pilot flew the doctors back to their base.

But, you may ask, what about the Canadian airports? Well, first of all, the airports are located near towns which were built up from old trading posts. Not so with the "Flight Strips," for weather and terrain are our first considerations, and vital considerations along the Alaskan route. For instance, the weather at a certain important airport along the route is very uncertain. Conditions change rapidly. If this port is closed due to zero-zero visibility, as it often is, there is a "Flight Strip" along the Highway to the north and south. A pilot can locate both these "Strips" by following the Highway. Also, the "Flight Strips" have been laid out so they can be enlarged at any time to meet our expanding requirements. This is not always true of the airports, which were originally built to handle light planes of the pioneering "bush" pilots.

Because an adequate communications service is essential for the route, the U. S.

Signal Corps, at our request, has built such a communications line. It includes repeater stations and a TWX system. Then the Army Air Forces Weather Service established weather observation stations and weather forecasting stations along the route. These stations and the communications lines are coordinated with the "Flight Strips." As a pilot flies over a "Flight Strip" he can receive by short-wave radio a complete weather report, which is sent over the TWX system on the Highway for the entire route.

THE mere fact that a highway, easily discernible from the air, runs from this country to Alaska has given confidence to inexperienced personnel flying the route and has proved to have a marked effect on the morale of ferrying personnel. Markers are being constructed on the ground along the Highway route. In case pilots should get too far to the left or right of the Highway, these markers are easily visible from a distance.

Air Transport Command pilots of the Alaskan Wing now flying the northern hop use the "Flight Strips" Alcan Highway Map. This map shows them where the "Flight Strips" are located, in relation to airports, where the weather stations are, and other important landmarks easily discernible for contact flying.

Shelters have been built at each "Flight Strip" along the route. These shelters house approximately eight men. A stove, kindling wood, axe and other emergency equipment are always available in the shelter, as is the telephone connecting the "Strip" with the nearest repeater station communications system.

There is bound to be considerable difficulty with sickness and emergency situations among the personnel operating the Highway. "Flight Strips" will keep the rest camps and other sections of the High-

way in immediate contact with the larger bases or command headquarters. When sections of the road are unusable at certain times of the year due to bridges being washed out and the like, "Flight Strips" will play another important role.

"Flight Strips," by the way, are shown on all aeronautical charts by a special symbol. Two windsocks are on each "Strip" and in many cases these socks are lighted. The runway is always built in the direction of the prevailing wind.

All "Flight Strips" located on a civil airway become staging fields or auxiliary landing areas on a regular Air Transport route. Those located off civil air routes are being developed so they can be used for training without interfering with ordinary commercial or military air traffic.

All "Flight Strips" have been constructed at the request of a commanding general of one of the Army Air Forces commands and authorized by the Air Staff.

In establishing a "Flight Strip," every effort is made to obtain all available information regarding meteorological conditions in the areas being considered. In addition, local farmers are interviewed for further information regarding the peculiar characteristics of the location. Surveys must be made of at least 150 sites to be assured of obtaining fifty suitable locations.

Because many of the present Army air bases are former airports, there are various limitations to extending runways on these fields. This is due to the surrounding terrain and buildings and the proximity of the fields to cities. In many cases the cost of improving existing airports, compared to the cost of building "Flight Strips," is prohibitive.

IN one of the defense commands where it is difficult to obtain sites for airfields, several "Flight Strips" are being used as sub-bases. This means that housing facilities have been erected near the "Flight Strip" area for troops. In another section of the country, approximately eight "Flight Strips" have been assigned to different Army air bases as auxiliary fields for helping the training program. The "Strips," however, remain as part of the highway system.

One air force in this country is making first and second phase stations at some "Flight Strips" for heavy bombardment aircraft to step up the training program. Reports from overseas indicate that aircraft in the various theatres of operation must frequently use landing areas where only one runway is available. Training officers are of the opinion that if pilots have been given some training on a single runway type of landing area before receiving orders for overseas duty that they are better prepared for conditions in the combat zones.

Another air force is using three

THESE 'FLIGHT STRIPS'

DEFINITION

A "Flight Strip" is an area of land with clear approaches, located as a part of a highway right-of-way or adjacent to a public highway on public land, for use as an auxiliary landing area for aircraft. (Note: The highway itself is not used for the landing and take-off of aircraft.)

PROCEDURE

"Flight Strips" are authorized by an Act of Congress and constructed by Public Roads Administration in strategical areas designated by the Army Air Forces. They are maintained by State Highway Departments following completion.

TYPES

To facilitate the design, construction and description of the paved runway sections on "Flight Strips," the following lengths, widths and other design criteria have been adopted:

- a. The 4R30 "Flight Strip" is for use by tactical airplanes, including medium bombardment airplanes. This type is satisfactory for use by most transport airplanes. The paved section of the runway is 150' in width by 4,000' in length, corrected for altitude, and designed for a gross load of 30,000 pounds.
- b. The 5R-1 "Flight Strip" is for use by heavy bombardment airplanes, including the B-17 and B-24. The paved section of the runway is 150' in width by 5,000' in length, corrected for altitude, and designed for a gross load of 74,000 pounds.
- c. The 6R120 "Flight Strip" is for use by heavier airplanes than any now in operation. The paved section is 150' in width by 6,000' in length, corrected for altitude, and designed for a gross load of 120,000 pounds.
- d. The 8R120 "Flight Strip" is used for instrument landing operations. The paved section is 150' or more in width by 8,000' in length, corrected for altitude and designed for a gross load of 120,000 pounds or more.

"Flight Strips" for tactical operations for fighter aircraft and two "Strips" for medium bombardment aircraft.

Approximately six "Flight Strips" in one of the training commands are being lighted. This is being done by the installation of portable lighting equipment. If these "Strips" prove satisfactory in the first and second phases of training, some of them may be used as third phase stations.

The "Flight Strip" principle has been used in several overseas theatres, where their use as auxiliary landing areas and dispersion points for military aircraft has been of great strategic value.

Since the "Strips" are large and can be used by any type of plane, we are frequently asked what will prevent enemy aircraft from using these landing areas in the event of an invasion. Some "Flight Strips" are camouflaged; others are not. If a "Strip" is within a certain distance of coastlines or the Gulf of Mexico and is used regularly by our military forces, it

may be camouflaged or toned down. But the point is that all "Flight Strips" must be protected, either by local civilian guards arranged for through the local communities, by the Public Roads Administration of the Federal Works Agency, or through the Office of the Provost Marshal. It may take troops and they may have to have anti-aircraft guns. The defensive strength of "Flight Strips" lies in the fact that we can have many "Strips" for use in case one of them is taken by the enemy. If the enemy takes an airport, the entire combat force is made useless.

No attempt has been made in the development of "Flight Strips" to use these landing areas as a basis for the construction of more elaborate installations. In fact, the desire to develop the "Strips" into conventional airports has been resisted in order that the value of "Flight Strips," as such, may be determined by use of these facilities as originally planned. It has been found, however, that certain "Flight Strips" possess operational characteristics which warrant continued tactical use. In these instances, housing and technical facilities have been constructed on land adjacent to the "Strips."

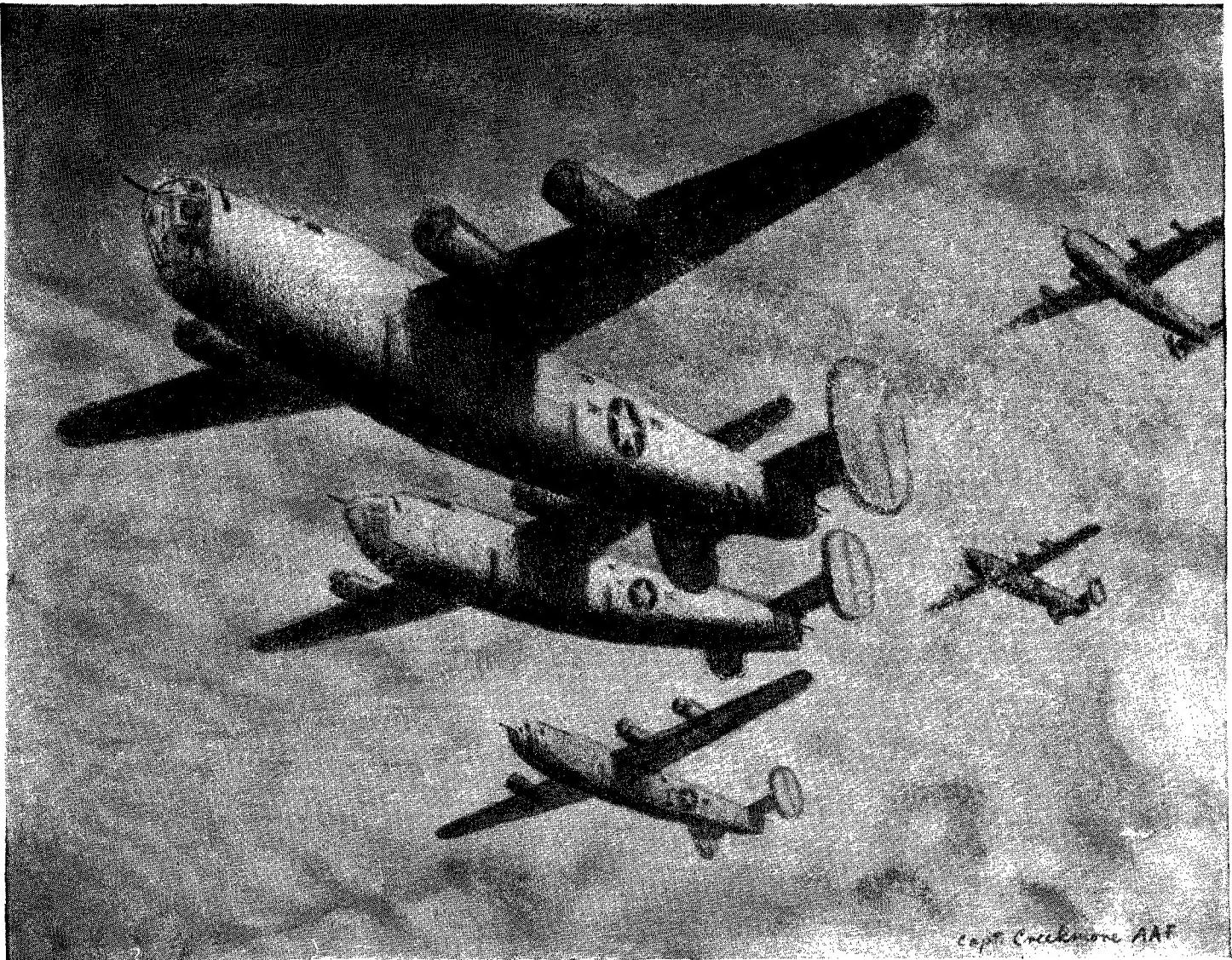
A final wartime consideration is the fact that less than one percent of critical items have been used in the development of all "Flight Strips" to date. This is due to the fact that the policy of using local material has been clearly established.

In addition to their wartime use, "Flight Strips" promise to play a major role in domestic post-war aviation. I will not go into that discussion at length because right now we have a war to win. But in passing I submit these few, briefly expressed thoughts.

The location of airports has paralleled the location of cities, and cities were built irrespective of weather or terrain—as they apply to aviation. Many of these airports are not only unequipped to accommodate the aircraft of the future, but cannot be expanded to handle such aircraft. We know that airports in our large cities are often closed in by purely local conditions, principally fog and smoke. We also know you can build just so many airports in a given city and that an airport can take care of just so much traffic. Assuming a substantial increase in air traffic, we can appreciate the need for auxiliary airfields outside the city belt dominated by fog, smoke and congestion. Finally, for areas not near cities, we know that the cost of constructing and maintaining the huge airports needed to handle our future planes is likely to prohibit the expansion of air traffic on a substantial scale off the established air routes.

"Flight Strips" can be built almost anywhere space is available, without regard to cities. Weather and terrain are first

(Continued on Page 48)



HELL OVER BIZERTE

By Lieutenant H. M. Locker

A co-pilot's story of blood and bullets in a B-24 during a bombing raid in North Africa

IT was the day after Christmas. . . .

We took our regular place, number three in the last element of the formation, and off to Bizerte we went. We flew east past docks south of the town just far enough to miss the flak.

Swinging north and back west for our run on the target we could see the flak hopping all around the planes in the first element. I knew it would get worse as element after element of three ships came up to the bomb release line. And our B-24 was the last of the group.

Every plane was leaving a beautiful vapor trail to guide the flak and fighters to us. Now we were in the stuff. It was bursting all around in those greasy black puffs. Many times the ship bounced from an explosion. Someone in the rear called out, "We're hit," but no difference could be felt on the controls, and Harry Lawrence and I were busy. It was time for the bombs to go. We were loaded with six one-thousand-pounders. I watched the bomb release light blink six times.

I turned then for a look at Tom Borders, flying number two in the Birmingham Blitzkrieg, to see his bombs go. I've always had a mania for watching those beautiful golden eggs come sliding out. This time I wish I had curbed my curiosity, for just as my eyes found him there was a blinding flash and the loudest

explosion I've ever heard. I saw the tail of Tom's ship fly backward; then down toward the ground five miles below. It was the only visible piece of the ten-man crew and airplane. A direct flak hit in his bomb bay had set off three tons of TNT. When the flash and smoke cleared there just wasn't anything left.

But right now we were having our own troubles. I remember saying, "Poor boys, God bless them," and, in the same instant I saw our right wing tip curl up. About three feet had been broken off by the explosion. Number three and number four engines were just starting to burn. The rest of the formation turned north to avoid the flak, but we were too busy to turn and began to fall back fast.

Right down flak alley we flew. The constantly

(Continued on Page 44)

OVER BUNA



Prepared by the Arctic, Desert and Tropic Information Center

THE flight of five B-25s scrambled off the Port Moresby strip for an egg-laying jaunt over the Jap shipping roost at Gasmata in New Britain. The date was July 26, 1942. The time: early morning.

They never reached the target area. Twenty Zeros jumped them at 12,000 feet over Buna, swarming in from every direction.

Captain Frank P. Bender saw four Zeros go down, saw one of the B-25s hit, felt his own ship shiver under a sudden blow, sensed shrapnel ripping into his left leg. The nose of his plane dropped. The wheel snapped back into his lap. With control cables dangling uselessly, the ship went into a steep glide.

Bender ordered his crew to hit the silk. The two rear gunners got out. Then the ship caught fire. The co-pilot started for the escape hatch. Bender, looking back, saw him reach into the flames for the release—and miss it, saw him sucked into a blazing hell. Flaming fabric peeled off the control surfaces. The ship went into a spin, hopelessly out of control. Bender, wedged helplessly in the cockpit, waited for the end.

The rest isn't clear. There was an ex-

plosion—perhaps the gas, perhaps the bombs or the oxygen. Bender came to, at what he thinks was about 3,000 feet—thrown clear of the ship. His eyes were fixed on an enormous object under his left armpit. He pulled it. The chute opened.

There was pain in his right knee, gashed somehow when he parted company with the ship. It didn't much matter just then. In the distance he saw the wreckage of the plane. Below him ran a stream, bordering a native garden; he could tell by the clearing and the isolated trees in the center. It looked good. He landed in a young tree on the edge of the stream; and when it broke under his weight, he slid to the ground, wrenching his back.

Bender crawled on to the jungle earth, dazed, his leg bleeding heavily. He had come down six miles from Buna. The time was 0900. He looked over the clearing. He knew there were natives about, for he could see their machetes lying around. Apparently, they had run off in terror.

As he sat there waiting, he got out his jungle kit and took inventory. Except for the bleeding mess of his right knee and

A bomber pilot's story of survival in New Guinea.

the shrapnel wound on his left foot, he was all there. He still had his pistol, and his G.I. boots were on his feet. He sat there waiting.

Twenty minutes went by. He knew the natives were near for he could smell the rancid coconut oil they smeared over their bodies. He began to shout "Tabada!"—Motuan for "white friend." A child scurried out of the bush, then another. Hesitantly at first, then with growing confidence. Then came the adults, filtering back into the clearing from which they had fled. Bender began to win them over. He held out his insignia, his wings and bars. That did the trick. Some of the natives reached for them, some went back into the bush to summon others.

A LEADER came forward, the proud possessor of a few words of English. Bender came through with a little Motuan, a little English, a great deal of arm-waving, and turned on what he hoped was a winning smile. He asked to be carried to the nearest mission, motioning down the paths radiating from the clearing. The natives finally understood. But first they helped Bender reach the scene of his plane's wreckage. There he found the bodies of his bombardier and engineer, thrown clear of the smashed nose. The evidence seemed to indicate they had been killed in the air. He gave instructions to the natives for the burial. Before they left the scene, Bender ground his sulfanilimide tablets into a powder and dusted it into his wounds, using the gauze bandages from his kit. The shrapnel wound healed in time. But the gash in his knee became worse. He couldn't walk.

The natives then carried him towards the mission, arriving there at 1500. Bender found the native residents in a state of apprehension, fearful that Jap patrols might come in momentarily. The missionaries offered to hide him. Then they told him that one of his gunners had just passed through, on his way to join an Australian who knew the country and the language, and who had headed out earlier for the Owen Stanley range and Port Moresby. Bender decided to push on.

The natives built a litter for him, supported by poles. Eight natives volunteered to carry. Four of them supported the litter; two went ahead with poles, one

on each side, separating the dense foliage as they went, while the other two, up front, hacked away a path with their machetes.

As they went along, the little caravan began to grow as if by magic, until groups of twenty to fifty natives trailed along with it, from village to village. The women followed their men, carrying food and smoldering bits of coal-embers for fire-making. Children tagged along. The strange procession made its unhurried way through the bush.

On the night of the first day Bender caught up with the Australian and Staff Sergeant A.M. Thompson, the gunner, and they joined the caravan. (The other gunner apparently was captured.) The Australian produced some tobacco, and natives were paid, each with a precious half-strip—the best currency in New Guinea.

The next morning the trek began in earnest—a harrowing, humid journey of ninety terrible miles through New Guinea swamp and over the rugged Owen Stanley range to Port Moresby. The trip was destined to take three weeks.

A kind of shuttle service was set up, from village to village. The caravan would start with a fresh set of bearers at 0600 each morning and stop for the day at about 1700. The next day, a new shift would take over.

Because the Japs were reported at Kokoda, the party detoured widely, twisting through the dense growth. They averaged four and a half to five miles each day. Every foot of the going was wet, wet underfoot and wet dripping from the jungle bush. The natives fed Bender at the stops. They gave him stewed pumpkin. He hated it. But he ate for fear he might offend the bearers and the rest of

the native entourage. He drank the water from the quick-running mountain streams. At first he used his iodine for purification, but as the wound on his knee grew steadily worse, he saved the iodine for dressings. He cut pieces of his parachute for bandaging and gave other pieces to the natives who prized them. He had taken his quinine regularly from the time he hit the ground, and the symptoms of malaria lay dormant (a malaria bout came three weeks later, at Port Moresby).

The experience related in this article is one of the many gathered by the Arctic, Desert, and Tropic Information Center at Eglin Field, Florida. It is the function of this organization to prepare and disseminate information on all aspects of Air Force operations (maintenance, health, shelter, clothing, etc.) in non-temperate zones. Information on forced landing procedures and survival is a major interest of the Center. All Air Force units are invited to request such information from the Arctic, Desert, and Tropic Information Center.

On they went. The wet was depressing, uncomfortable, maddening at times. The swaying of the litter was irritating. Often the bearers would run the litter into a tree where the going was rough, and Bender would cry out with pain. The natives laughed at him. They couldn't understand the white man's reaction to pain. They just went on creeping, slipping, parting the bush leisurely, ambling on childlike, singing, yodelling, yelling as they walked.

The native stench steamed up from the wet. It tried Bender's nerves. At times his impatience taxed all his control. His fingers itched for his pistol. But he endured. He understood the futility of driving the bearers. Anger was useless, even dangerous. He lay in the litter, day after day, his leg wound festering dangerously, and losing weight (from 150 pounds to 105 pounds in three weeks).

As they crawled on he watched the natives live off the land. They caught birds and ate them; they cooked bananas and pumpkins, and ate coconuts; they used the jungle vines for ropes, improvised all the means for existence as they went along. It went on and on, all wet, all swaying, all pain.

Late in August the long nightmare ended. Bender entered Port Moresby. He lay for three days in a hospital bed, wondering why it didn't sway. White man's food seemed a miraculous manna to him. It was a wonderful new world. On the third day he was flown to Townsville, in Australia, and hospitalized there for three months. On the first of November, 1942, he was back on American soil again.

Today, Bender (now a Major) reviewing his experience, has this advice to pass on to airmen operating in the Southwest Pacific area:

1. The natives are the surest means through which you can survive and reach safety. In more than ninety percent of the bail-outs and forced landings in this area, natives have played the most important single role in rescue. Appreciate this fact. Here's what you can do.

a. Learn something about the natives in the area in (Continued on Page 48)



FERNIM
ADTIC

UP WHERE THE SOUP BEGINS

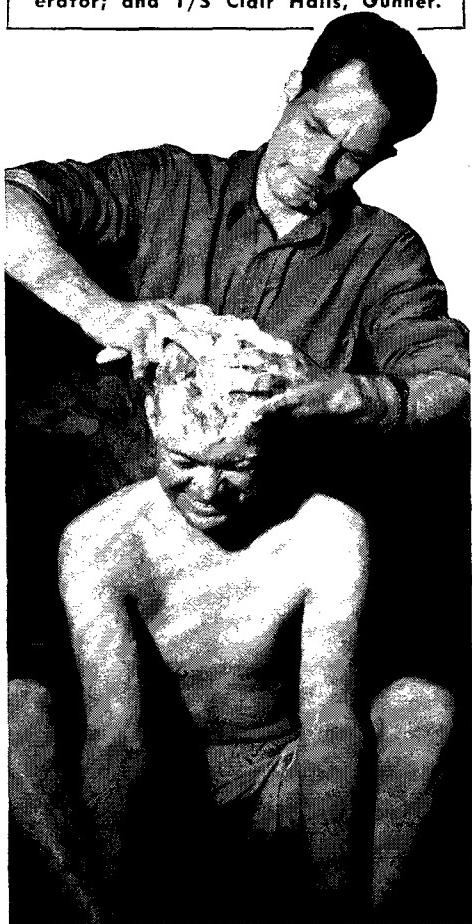


When the rain stops and the wind dies down, mud takes over.

AS TOLD TO

Herbert Ringold

By Lieut. William J. Wheeler, Pilot;
Lieut. Graham S. Campbell, Navigator;
M/S Norman C. Threewitt, Radio Operator;
and T/S Clair Hails, Gunner.



All we know about the Spring push up in the Aleutians is what we have read in the papers. We were on duty in that fog-drenched island chain for about a year, but unfortunately we returned before the current hunting season started. However, our gang did a lot of softening up preparatory to the recent action.

We fought the weather more than we did the Japs. *Snaju* must have originated as a description of the Aleutian weather.

First, there was the fog. Aleutian fog has been described as the kind of weather you can cut with a knife. Don't believe it. There isn't a knife made that can go through that stuff. But, seriously, we were only ten miles from a man-sized mountain for three months before we ever saw the damn thing. We got used to not seeing the sky. When you returned from a mission, your report would invariably begin: "Well, I was flying along in the soup—."

Then there was the wind. Up there you could see the wind blowing from two different directions at the same time. That's the truth. And although it's hard to believe, we often had more than 100-mile-an-hour winds. One day the weather report read "110-mile-an-hour winds—and strong gusts!" We had to tie down the B-17s and B-24s most of the time. Either we would attach a 55-gallon water tank to each wing, or sink a steel bar or wooden plank into the snow, tie a rope around it and attach it to both ends of

Hair must be washed no matter where you are, and it's a strictly mutual arrangement.

the ship. Even with that we had trouble. One day it took Captain Hetrick four hours to get to his target—and seven hours to get back.

And the rain. Did you ever see it rain up? It does at Umnak. When that wind decides to blow upward, everything goes with it, including the falling rain. But plenty of it came down. For days our airfield looked like a lake, with the ball turrets of the 17s all the way under water.

Yes, and it gets sort of cold up that way, too. In some parts of inland Alaska it gets down to eighty degrees below zero. So at Umnak we were practically sweating with our 35 below. But your Uncle Sam is on the beam with his clothing. A standard gag concerned the polar bear that put on one of our parkas and died of the heat. And at times it really got up to decent temperatures. For a while, it was warm enough to play baseball and volleyball on Umnak.

To top it off we had williwaws. A williwaw is the result of strong winds building up on one side of an island, passing over the island, and pushing all its strength downward on the other side. You just don't fly through a williwaw. They can usually be found on the lee side of the islands, so stay away.

After a while you get used to the weather. But it's harder to get used to the waiting. You spend half your life waiting for the weather to open so you can do some flying. Fighting the Japs wasn't bad at all—it was the sitting

Four Aleutian veterans sing a tune of "Hang your hat on a drift meter and get down near the water."

around waiting for the chance to fight. Sometimes we'd be only twenty minutes from our target and wait for weeks to get to it. No single factor had a greater effect on the men. We used to stay in bed so long that we had a tournament to select the "sack" champion. A fellow named Hanson copped the honors with 26 hours in bed at one stretch. When it looked like the weather might clear, we maintained a constant alert status. That meant that the entire crew, except the pilot and navigator, had to stay in the ship from morning 'til night.

When the weather became clear enough for us to see our hands in front of our eyes, we knew there was some flying to be done. Then we'd go out on the "milk run." These were the weather flights we made to send meteorological reports back to the base every thirty minutes. We called them the "milk runs" because they were so damned monotonous. It wasn't uncommon to be flying through the soup on such runs and report back "Weather unflyable." That's how crazy it all was.

Don't think there wasn't action. Our bases up there were so close to the Japs that we didn't need a lot of flying weather to get in some bombing. When we were there, the Japs didn't have much in the way of an air force. We never saw their regular bombers. Most of the time we ran into the float type Zeros, some with bombs attached to their wings, although they didn't do much bombing this way.

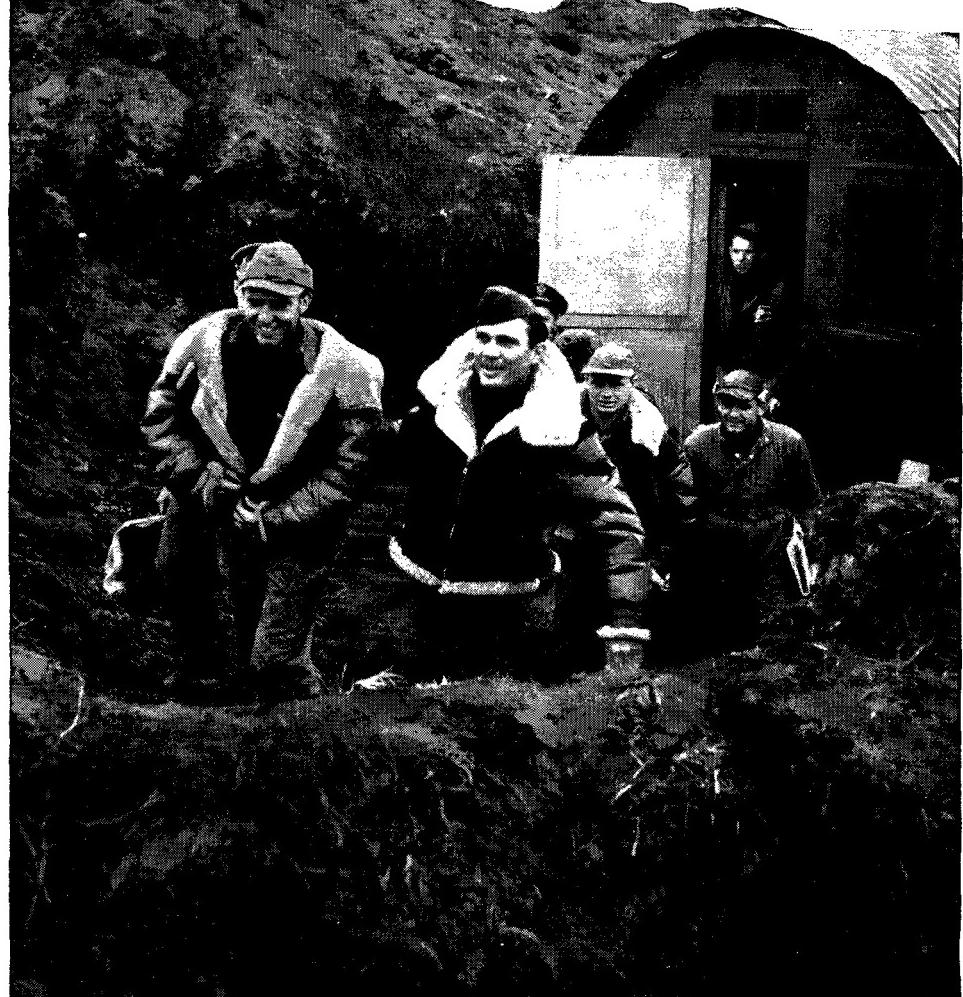
Those Japs really can fly their planes. Don't let anyone fool you about that. The pilots they had up there were plenty cagey. They often turned their ships upside down to shoot at us. A Jap would come out of the clouds on his belly and start firing, make a pass and dive away, then corkscrew up for a thousand feet, shooting all the way. Once we were about 2,000 feet over Kiska harbor heading for the main Jap camp when a float type Zero took off into the wind, looped around, and fired at us on his belly. But no cigars.

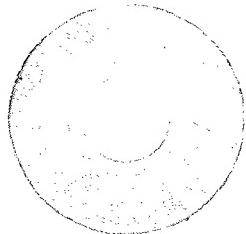
While they didn't have a strong air force, the Nips must have had every ack-ack gun that's ever been manufactured. The sky was actually black—real black—from the stuff they were squirting at us. And the falling shrapnel sounded like hail on a tin roof. On one mission a gunner reported that the ack-ack was fairly light—he only saw a hundred bursts above him. And the Japs were very accurate with those guns.

Our boys got around, though. Hell, after sitting on our rear ends for so long, a little thing like some ack-ack wasn't going to prevent us from getting our regular exercise. (Continued on Page 45)



You spend half your life waiting for weather to clear. Below, galvanized huts serve as home.





CHINA'S CADETS

By Captain Charles D. Frazer

"OUR ancestors came downstream ages ago to settle China's great coastal cities. Now, because of a war we did not want, a war that was pressed upon us, we have had to carry those cities upstream."

Cadet Shah thought a minute.

"One of our philosophers once said that China, as a nation, did not fight enough. Perhaps he was correct. We do not like to fight. But we have learned and some day we will move our cities back."

This young cadet referred, of course, to the migration inland achieved by some 50,000,000 of his countrymen, a mass exodus—perhaps the largest in history—during which the gallant Chinese, following the Yangtze, carried on their backs more than 600 factories from one city alone, dragged boilers fifteen feet in diameter up the steep and craggy hills of Chungking, and so stripped the metal from the city of Hankow, for example, that not even the heavy sewer plates of its streets were left to the pillaging Japanese.

Cadet Shah is 24. His breeding and intelligence and crisp military bearing are such that you would single him out in any group of men. He has been in the war for six years, was a lieutenant in two other branches of China's armed forces and as

a tank commander took part in the famous Battle of Kwang-Si Province before coming to America as an aviation cadet.

Shah it not his real name. Japanese reprisals being what they are, there is danger in names. But, more important, Shah would shrink from personal publicity. Like all his fellow cadets, he has an honest modesty that is compelling. He consents to an interview only because his background and attitude toward the war fairly represent those of hundreds of Chinese now in flight training under the auspices of the Army Air Forces at various bases in the Southwest.

WHETHER they are to be fighter or bomber pilots, the training given these men is identical with that given our own students. They fly the same planes, study the same manuals.

Generally speaking, their aptitude is about the same. They do, however, have their own mental approach to the war itself—an approach conditioned by years of struggle with inadequate weapons against a vicious and powerful enemy.

Shah was born in a coastal town, he tells you proudly, in the native province of Generalissimo Chiang Kai-Shek. He had primary education in Peking before going to Shanghai, where he attended

high school and began his college course.

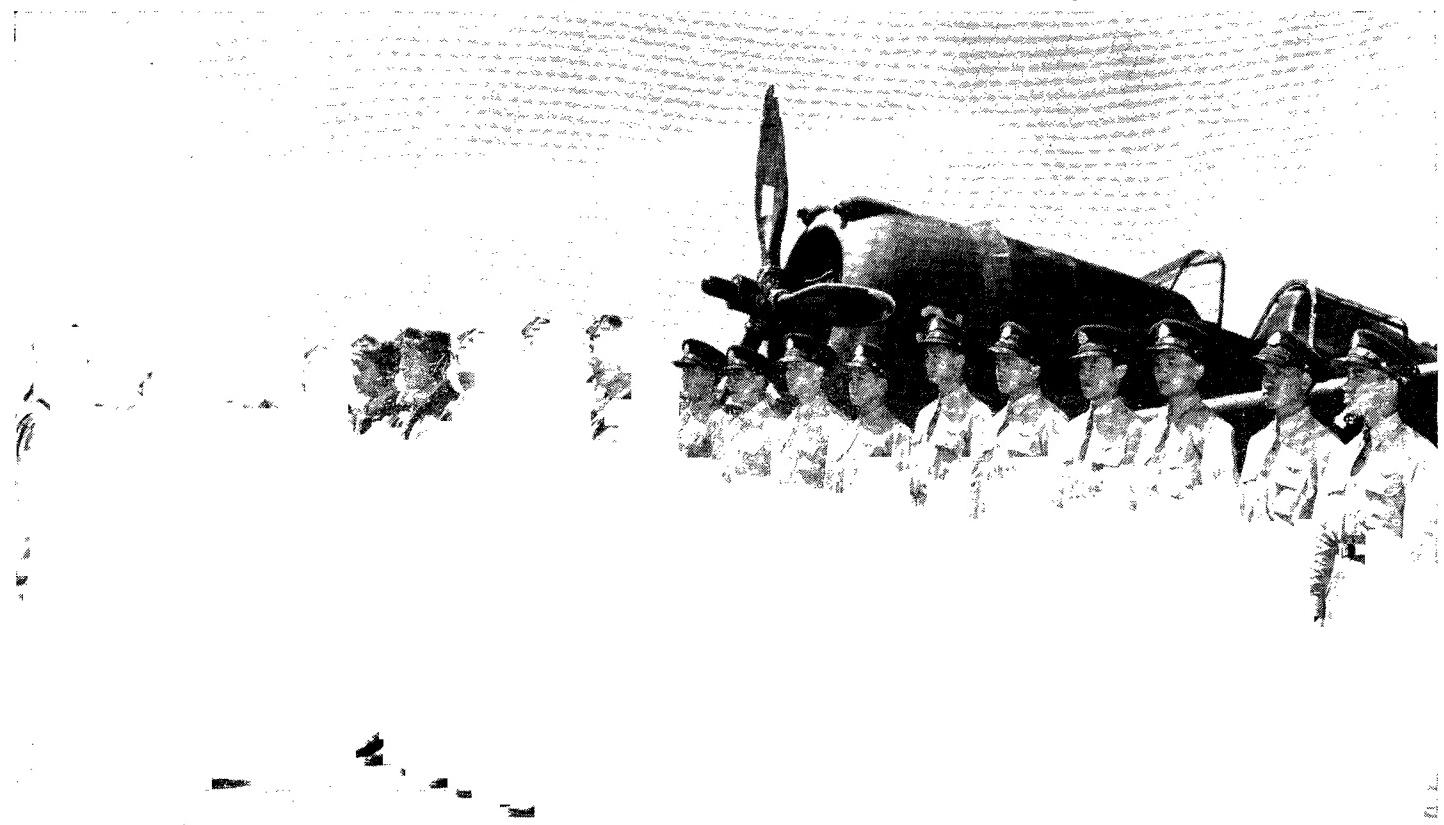
Stocky, of middle height and athletic build, Shah played basketball and soccer—both popular sports in China because so many can participate at such little cost. Mostly, however, he played tennis and badminton in Shanghai's clubs, where he met many British and Americans.

"Then, in 1937, when a sophomore in college, I joined the infantry," Cadet Shah explains in precise and cultured English, "and remained in that service, as first lieutenant, until August, 1938. My early preference was the Air Force but my teachers dissuaded me on the ground that I was an only son."

"While I followed this advice, I did not feel well suited to the infantry. So in 1938 I gave up my commission to become a cadet in the Army's Academy for Mechanized Forces.

"Normally, it takes a year and a half of study to be commissioned as a tank commander but in January, 1940—just before we were to graduate the Battle of Kwang-Si Province entered a serious stage, so we were released before actual graduation to take our places as second lieutenants with the 5th Army."

After five months of see-saw fighting for control of this province, the Japanese forces withdrew. During this period,



Chinese cadets train on AAF flying lines for the day when they will move to the attack.

Shah commanded a tank in several important drives and is understandably proud of the fact that "the whole province is still clear of the enemy right now."

Shah later served as an instructor and worked with Allied advisors in the perfection of intelligence operations, the development of plans, and the like. He was promoted to first lieutenant but preferred combat service and felt that his best chance of obtaining it was as an Air Force pilot.

THE transfer was not easy; in China the Air Force is independent of the Army. But at last he obtained permission from his superiors and gave up his commission to start aerial training in March, 1941.

It was in October of that year that arrangements were made to train many Chinese air cadets in this country.

There were two principal reasons behind this. First, China had so meager a supply of aircraft and gasoline that the training of flyers was severely limited. It was far more economical to bring men here than to ship necessary planes and supplies to China. Second, many of the Chinese fields available for the purpose were unsatisfactory. The Japanese had occupied much of the country. Some of the training fields still left to the Chinese were within Japanese bomber range, and this interfered disastrously with training operations. Some were located high in the mountains, as much as 7,000 feet up, a difficult altitude at which to start inexperienced men.

Cadet Shah was in the basic phase of training when he was selected to come to the United States. Before his group could leave, the Japanese had attacked Pearl Harbor and thereby cut off the normal method of travel to this country.

The cadets had to wait. "That was heartbreaking," Shah recalls. But at last they left China in March, 1942. They flew to India, then traveled by ship to New York and finally reached Arizona.

Shah, in May of this year, was nearing completion of his advanced twin-engine training in AT-9s and was looking forward to O.T.U., with a preference for the B-25 bomber.

Why did he choose bombardment?

"I might have preferred to be a fighter pilot," Shah admitted. "It is, I think, a more interesting type of flying and offers a better opportunity for personally shooting down enemy planes, which of course satisfies the desire for revenge. But if we all took that view, China would have no bomber pilots. And training for bombardment will be the most difficult kind for China to achieve by itself."

This statement points up what is perhaps the most notable characteristic of Chinese cadets—their selflessness. The war to them is purely a cause. Their own personal futures, their lives, mean nothing. Talk to Chinese students and you will find them courteous, cheerful, studious, thoroughly disciplined and mentally concentrated upon one thing—combat.

"We have shut our minds against our homes," explains Shah, "because many of us come from cities and provinces now occupied by the enemy. We do not correspond very much, if at all, with relatives still living in occupied areas, for it is through the mails that the Japanese trace people whom they mark for reprisal. Many men have asked their parents to forget them completely. Our one aim must be to save China."

Col. C. J. Kanaga, Director of Training for the Chinese in the United States was attached to the American Embassy at Peking for four years and is exceptionally fluent in the Chinese language. He has nothing but praise for the Chinese as students of military aviation.

"The men we train are picked men," says Col. Kanaga. "Virtually all have had military academy training and have been commissioned in other branches of the armed forces before signing up as cadets. Most have had combat experience.

"THEY receive here the same training given any American boy. Primary, basic, advanced single—or twin-engine, and twelve weeks of O.T.U., generally in P-40s or B-25s.

"But along with their flight work, the Chinese have the dual responsibility of learning some English. Our policy in this respect is to teach them in daily English classes only such words, phrases and sentences as will help them learn to fly. These lessons parallel their training. For example, when a cadet begins work in a Link Trainer, his English lessons will be descriptions of how the Link operates."

Some of the cadets, like Shah, speak our language perfectly, having learned it in China. Others pick up enough for ordinary purposes. Conversely, their American flying instructors absorb some of the Chinese language. But heretofore, interpreters have been relied on for conversation between instructor and student.

"This has presented difficulties," Col. Kanaga points out, "because it prevents an instructor from correcting his cadet at the time a mistake is made. He must do it later through an interpreter. But an interpreter is not a flyer and, therefore, much is lost in the transition. The answer will be, I think, to keep some of the out-

standing Chinese cadets in this country to serve as instructors in future."

An understandable yet bothersome complication of the language problem is the need for the Chinese to learn the slang of our flying lines. For instance, a student must not only recognize the meaning of "advance the throttle," let us say, but must also understand five or six of the common slang expressions used by American pilots and instructors to indicate the same operation.

Most of the training of Chinese cadets is taking place in Arizona and New Mexico, with large detachments at Luke Field, Williams, Thunderbird and Roswell, among others. These detachments, while under direct U. S. Army Air Forces supervision, have officers and enlisted men of their own.

The bulk is pilot training, naturally. Elimination is low—less than ten percent—partly because much of the elimination of unsuited cadets takes place back in China in elementary flight tests. Those men who are eliminated in this country go to other schools in the Army Air Forces, to study armament, perhaps, or observation or maintenance—some phase of military aviation which will make them valuable on their return to China.

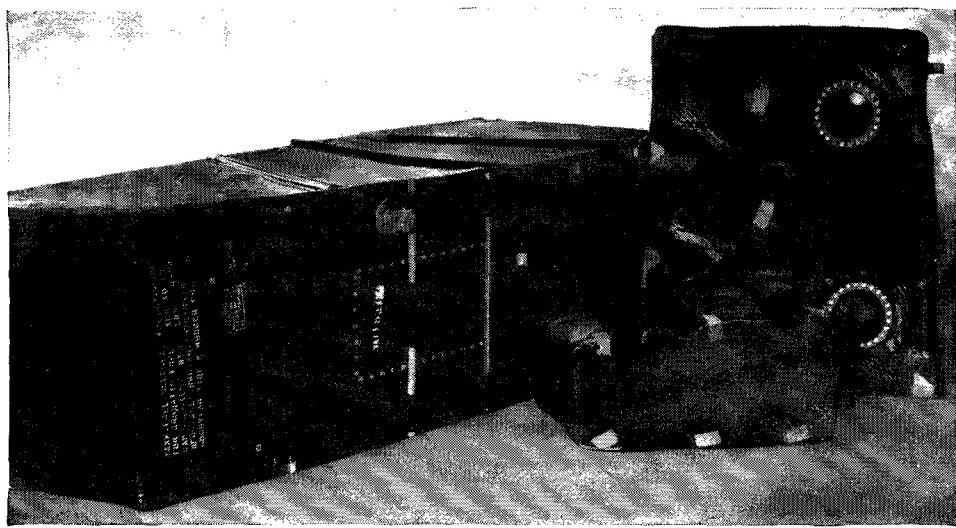
"As pilots they are earnest, studious and very capable," says Col. Kanaga. "Some men, of course, just can't get the hang of it. I remember one boy who invariably got lost on cross-country flights; he had forced landings all over Arizona, yet never so much as scratched a wing-tip. But for the most part they are good all-round flyers--on the ball as the instructors say."

The cadets themselves have a consuming and common urge to have our people know how much they like us and the country, and how much they appreciate the chance to train here. They are filled with wonderment at some of the things they have seen.

CADET SHAH was astonished at Arizona,

"Geography is one of my enthusiasms," he says, "and I had read a great deal about the United States. My books had informed me that Arizona was a desert country. But here we have found these wonderful irrigated valleys, with rich farms and ranches and fine cities. I know parts of China which should be like this some day."

Nobody who has met and talked with Chinese cadets could possibly question the sincere friendliness of these wartime visitors. It is a unique and warming experience to attend one of their early morning classes and to see the cadets, in trim, orderly ranks, dressed in American uniforms with the gold-and-blue shoulder patch of the Chinese Air Force, start their day by singing with a gusto rarely found anywhere the song of the AAF—"Off we go, into the wild blue yonder. . . ." *



Above are some typical fuel cells. Note that all fittings are covered with masking tape. Inspection doors are safety wired and cells are properly stenciled for identification.

Self-Sealing Cells

By LIEUTENANT C. G. WYMAN and J. E. NAGLE
PATTERSON FIELD, OHIO

A self-sealing fuel cell is a gasoline container constructed by building up several layers of natural and synthetic rubber.

The bullet-sealing quality of the self-sealing fuel cell is based upon the chemical principles that synthetic rubber is gasoline resistant and natural rubber is not. By control and manipulation of these factors the self-sealing cell has been developed into an efficient and practical component of combat aircraft.

Many types and varieties of fuel cell constructions are now used in service aircraft but all constructions depend upon these primary chemical principles.

Basically every self-sealing fuel cell is constituted of three parts: the inner-liner, the sealant and the retainer or cover, sometimes called the outer-liner. The average cell contains from five to seven layers of material but these layers may all be classified under one of the three basic parts.

The inner-liner is the first or interior layer. This is a synthetic rubber sheet. It is the gasoline resistant quality of this layer that allows gasoline to be contained in the fuel cell without causing deterioration or damage to the cell. Obviously, no fuel can be manufactured without a gasoline resistant inner-liner.

The sealant is the second or middle layer of material. This is a sheet, or series of sheets, of natural rubber. The sealant may be made of one or more of several types of natural rubber, generally sponge, coagulated latex or semi-vulcanized rubber compound. As the name implies, the sealant is the material which

reacts with gasoline to close the puncture resulting from bullet penetration.

The retainer or cover is the outer or exterior layer. Its primary purpose is to lend strength and protection. Various types of material have been used for the retainer in past constructions. Prominent among these were leather, vulcanized rubber, fabric and rubber-impregnated tire-cord. The latter is now being used exclusively in standard AAF-approved construction.

Basically, the function of the self-sealing fuel cell is this: Upon penetration by a projectile or other object, gasoline seeps through the damaged area of the inner-liner and comes in contact with the natural rubber sealant causing the rubber to swell to many times its normal proportions. This swelling reaction closes the puncture prohibiting further gasoline leakage.

The introduction of special blends of fuel into service-type aircraft has presented a variety of difficult problems which have been overcome. However, there are many self-sealing fuel cells which were manufactured prior to the use of such fuels and these cells require additional treatment.

All self-sealing fuel cells now being used by the AAF are built with an inner-liner of one of these four materials: buna, neoprene, thiokol or royalin.

Buna synthetic rubber is resistant to special fuels insofar as actual disintegration is concerned. However, buna, by itself, is not resistant to special fuels insofar as dispersion through the liner and

into the sealant rubber is concerned. Buna fuel cells now under construction contain a synthetic dam or barrier between the liner material and the natural rubber sealant. This barrier is very effective in stopping the dispersion of fuels. Buna-lined fuel cells which contain a synthetic barrier do not need to be treated in any way for special blends of fuel. All buna-lined fuel cells which do not contain a synthetic barrier must be slushed with Fuller's Slushing Compound TL-284 (AAF Specifications 3595) which is the only slushing compound approved by the AAF. Ethyl acetate, which is the basic solvent for Fuller's Slushing Compound, is detrimental to buna synthetic rubber, so buna lined cells should not be slushed unless required by above classification.

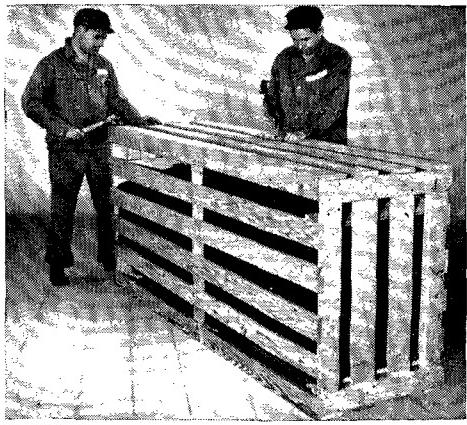
Neoprene synthetic rubber is not resistant to special fuels and will deteriorate when in contact with them. Therefore, it is imperative that all neoprene-lined fuel cells be flushed with Fuller's Slushing Compound TL-284 (AAF Specification 3595).

Thiokol synthetic rubber is resistant to all blends of fuel. None of the special blends will disintegrate or disperse through this type of liner. Thus, thiokol-lined cells need not be slushed under any circumstances, nor should they be because the ethyl acetate solvent contained in Fuller's Slushing Compound TL-284 is detrimental to thiokol synthetic rubber.

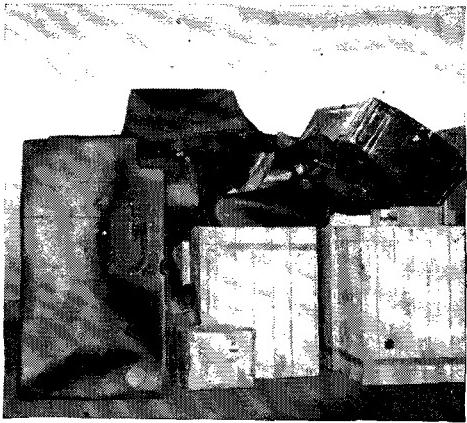
Royalin plastic, which acts in the same manner as thiokol synthetic rubber, is resistant both to disintegration and dispersion by blends of fuel. Ethyl acetate is also detrimental to royalin-lined fuel cells, which also should never be slushed.

Below is a deteriorated fuel cell. Extreme care must be exercised in re-fueling in order that no gasoline is allowed to spill or overflow on the exterior. The exterior of many fuel cells is not gasoline resistant and disintegration from contact with gasoline may cause future failure of the cell.





RIGHT. Fuel cells which are to be shipped or stored should be crated as shown. Remember never to stack crated fuel cells so high that the bottom one is under pressure. Crate all cells so that the fittings are secured and the cell does not sag. If possible, store and ship them in their original containers. Privates Matthew Bodamer (left) and Cecil Allen of Patterson Field are shown doing a proper crating job.



WRONG. Never stack uncrated fuel cells. Uncrated cells should be given an individual space, placed on their widest surface and supported from the interior so they do not sag under their own weight. Never store fuel cells without properly crating them. Great harm is done to fuel cells by any change from their original shape, as collapsing, warping, bending or twisting.

Inspection alone is not sufficient to distinguish between the various types of cells or to determine if slushing is required. The type of cell at hand may be determined only by reference to T.O. 03-10-26, which lists the construction numbers stenciled on each tank and describes the type of cell by these numbers.

Because of current discrepancies in the information previously supplied to AAF activities, a number of self-sealing fuel cells have been unnecessarily treated for resistance to special blends. Extreme caution should be exercised in the use of thiokol or royalin-lined cells which have been slushed, since it is difficult to determine the extent of damage by the ethyl acetate solvent to the liner.

Moreover, it is inadvisable to attempt to remove the slushing compound from these cells due to the fact that ethyl acetate is also the cleaning solvent that

would be required to remove it. Use of this solvent in removing the slushing compound would only cause further damage to the seams and the fuel cell lining. Do not reslush fuel cells. The original slushing is considered satisfactory throughout the life of the cell.

One of the chief causes of fuel-cell failure in the past has been the disintegration of the retainer or covering of the fuel cells caused by gasoline coming in contact with the exterior of the cells.

The covering of all fuel cells now in production is being coated with buna synthetic rubber, or with a resistant lacquer to prevent deterioration caused by spillage of gasoline. But those of previous construction are not protected for spillage in any way and will disintegrate rapidly when repeatedly splashed with gasoline. The buna-coated exterior of present production cells will remedy this situation to some extent. However, because no synthetic barrier is provided under the Buna coating for the exterior covering, gasoline of certain blends eventually will penetrate into the natural rubber layers. Therefore, extreme care should be taken in all cases to avoid spillage of gasoline on the exterior surface of all fuel cells.

The main cause, however, of fuel cell failures—both in the past and at present—may be traced to faulty and careless installation and removal methods. Particularly is this true in cases concerning aircraft whose fuel cells are of the so-called collapsible type.

By the very nature of its construction, the self-sealing fuel cell is injured by any alteration of the cell from its original shape, collapsing, warping, bending or twisting. In some cases, of course, there is no alternative and collapsing the cell becomes a necessary evil. Many types of aircraft now incorporating self-sealing fuel cells were not designed originally for these cells and, as a result, cells must be installed and removed under undesirable conditions.

In view of these facts, it is extremely important that all fuel cell installation and removal work be placed in the hands of competent, trained men who understand the care which is necessary in the handling of self-sealing fuel cells. An inexperienced crew should never be allowed to install or remove fuel cells unless the job is done under the guidance of capable and conscientious supervisors.

The Maintenance Division of the Air Service Command has established a unit of trained fuel-cell experts to assist in all maintenance and repair problems on self-sealing fuel cells which arise within the AAF. Any questions or comments on fuel-cell problems should be addressed to the Commanding General, Air Service Command, Patterson Field, Fairfield, Ohio, directed to the attention of the Chief, Maintenance Division.

Boot Starter

The Bungee starter, as used by the AAF Flying Training Detachment, Ocala, Florida, consists of a boot, shock cord and rope handles. The boot, six by nine inches tapered to a point like a rounded "V" is made from two pieces of $\frac{3}{8}$ inch belting riveted together. To this is attached at the point of the "V" five feet of $\frac{5}{8}$ inch manila rope, then an eight-foot length of $\frac{5}{8}$ inch elastic shock cord. Two four-foot manila ropes go at the end for gripping pieces. To operate, the engine is primed by turning the propeller by hand, then the boot is placed over the end of the blade on the far side and needed tension is gained by two men pulling slowly, as shown in the accompanying photograph. The propeller can now be started with only a slight lift from a third man. As the propeller whirls the boot flies off. — Flying Training Detachment, Ocala, Florida.

The Bungee Starter in action.



Flashlight Guides Night Parachute Deliveries

To provide a means of speedy identification of aerial delivery containers dropped during night operations, the Materiel Command has developed a new type of identification lamp assembly.

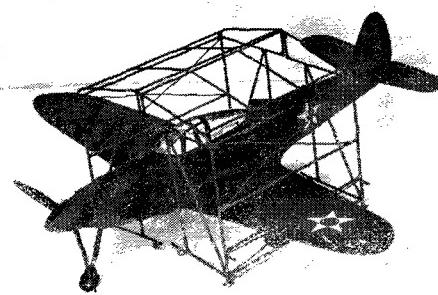
It resembles the ordinary flashlight but is made of plastic and has a light bulb at each end. Colored plastic caps of blue-green, red or yellow can be snapped over the bulb so that types of aerial delivery loads can be easily identified by means of the different colors. The cylinder holds three flashlight batteries.

On the outside of the lamp are two loops for attaching the lamp to the delivery containers. A spring contact switch on the exterior of the lamp is equipped with a fibre separator so that the switch is kept open except when the lamp is actually in use. The assembly is so arranged that when the load is dropped a cord attached to the parachute line withdraws the fibre separator from the switch and the light is automatically turned on when the parachute opens.

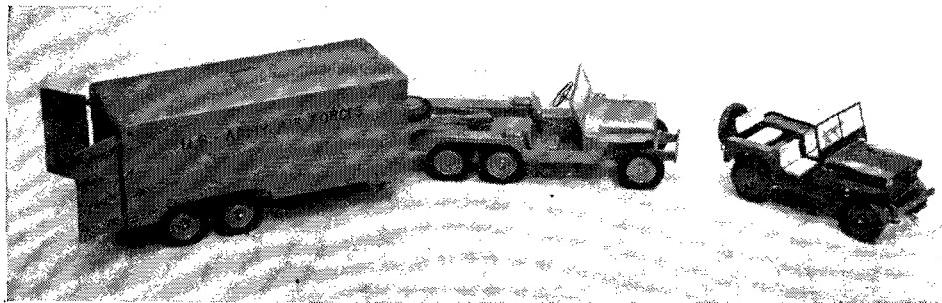
The weight of the lamp, except for batteries, is 5.6 ozs. (Technique Continues)

TECHNIQUE

(Continued from Page 19)



Model of a special repair scaffold.



Even extra heavy equipment is duplicated.

Designing With Models

Tiny models are dictating the designs for various types of maintenance equipment, small service trucks, portable repair shops, bomb cradles and other miscellaneous field devices used by the AAF. The miniature planes, trucks, gasoline storage tanks, portable houses and other airborne equipment, all precision-built to one-thirtieth exact scale, are daily saving the government thousands of dollars in its never-ending task of finding the best possible equipment for our combat Air Forces.

"Building the models first," one engineer explains, "makes it possible to study desirable shapes and sizes for the large equipment without going into the tremendous cost involved in the building of full-sized products."

The plant for the construction of these models is a small workshop in the big Miscellaneous Equipment Unit of the Materiel Command at Wright Field, where the models are scaled down by draftsmen from full-sized blueprints furnished by various manufacturers and then built of wood and metal. They range in size from a tiny one-inch bomb cradle to a three-foot scale model of a four-engine bomber complete with retractable landing gear.

One of the most delicate models is a six-wheel truck-trailer combination so complete in detail that the truck even has a tiny rear view mirror. Another intricate model comprising hundreds of small parts is a replica of a huge crane whose real life version is used to haul around 25-ton

bombers as though it were lifting a sack of wheat.

Other models include latest type fighter planes, bombers and cargo carriers, each with movable controls, instrument panels in the cockpits and hollow cabins which permit arrangement of cargo inside the planes; jeeps, peeps and a truck with three gasoline carriers attached; a small glass-enclosed portable machine shop, canvas-covered engine repair housings, a cargo truck, and a long heavy trailer much like a flatcar, a current development and only recently produced a full-sized model.

Because the models to be of value must be precision perfect, they sometimes require as long as two or three weeks to

Sixty-five enlisted men have already benefited from instruction received in the school, which was organized at the suggestion of enlisted personnel and through the cooperation of the commanding officers and top-rated N.C.O.s.

The program covers studies of aircraft engines, general airplane maintenance and engine maintenance, serves as a refresher course for older men and develops skilled mechanics out of the basics.

Since its beginning the course of instruction gradually has been expanded to include a study of steps necessary to complete a successful 25- and 50-hour inspection, the use of tugs and heavy tractor equipment, operation of wing jacks for four-engined planes, and instruction on instruments and electrical systems. Schedules are arranged to enable men on night shifts to participate. In addition to technical phases, one hour daily is devoted to the study of manuals and T.O.s.

Credit for organization of the school goes largely to First Sergeant Roland F. Grisson, Master Sergeants George Gromoshak and William H. Kelly, Staff Sergeants John Ramsey and Arnold King, and Sergeant Joseph Verdun. They also served as instructors. Lieutenant Wilber Hamstreet, Squadron C.O., and Lieutenant Charles D. Horvath, adjutant, gave full approval and assistance.—**Air Transport Command.**

High Altitude Brushes

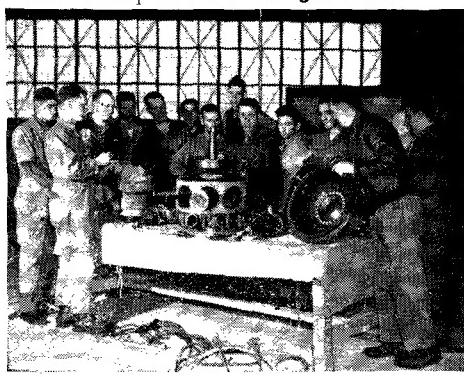
An intensive five months' research program stimulated by complaints that brushes on generators and engines were wearing out within two or three hours on planes flying at extremely high altitudes has resulted in the development of new brushes with an effective high altitude life of from 40 to 150 hours.

Two B-17s, assigned to the project at Wright Field, rolled up a total of 500 hours of comprehensive testing in 107 flights, after it was determined in earlier experiments that brushes operated satisfactorily in high altitude test chambers but wore out after a few hours of actual operation above 25,000 feet.

The Engineering Division called in electrical technicians from all manufacturers capable of supplying materials, motors and generators, and in October of last year began a series of high altitude test flights in rarefied atmosphere above 30,000 feet.

One of the B-17s was converted into a flying electrical laboratory. Panels of testing instruments, installations of generators and motors for tests under observation, temperature recording gauges, and many electrical recording devices were mounted in the radio compartment and in the bomb bay.

Flight after flight was conducted, those over 30,000 feet usually of three hours' duration. Civilians and officers spent



Training continues behind the front lines.

Tech School in Combat Zone

One of the few (possibly the only) AAF technical schools in a foreign theatre or combat zone was established several months ago along the North Atlantic Route by a ferrying squadron of the Air Transport Command to take worthwhile advantage of the enforced inactivity due to weather conditions.

their days "upstairs" testing new materials and new designs, recording instrument readings of the hundreds of variants of the flights, and observing how generators and motors survived under increasingly heavy electrical loads. In the evenings all observations and readings were reviewed and worn-out materials were thoroughly examined and tested.

It was discovered in the early stages of these tests that motor and generator parts were wearing out at high altitudes because of friction resulting from a lack of lubrication. This factor was not present at lower altitudes, because while the air at high altitudes is almost absolutely dry, that at lower altitudes contains sufficient moisture to serve as a lubricant for the brushes.

Before a satisfactory brush had been developed, 27 different brushes were tested, not including those which were proved unsatisfactory in laboratory and high altitude chamber tests.

Flight tests were completed in March with the perfection of brushes capable of operating from 40 to 150 hours efficiently and continuously under heavier-than-normal loads at altitudes above 30,000 feet. This development assures a constant supply of electrical current to operate guns, turrets, automatic pilot, props, radio and other equipment in aircraft at high altitudes. — **Lieutenant Robert V. Guelich, Wright Field.**

Swapping Engines

A shortage of R1820-51 engines made it necessary at Hendricks Field, Florida, to modify B-17Bs to permit use of R1820-65 engines. This tricky problem was solved by Glenwood A. Schaefer, 25-year-old civilian employee at the 95th Air Service Command Sub-Depot.

Here's his solution, reached after days of studying the standard Boeing cowl flap assembly:

An Adel type G-9744 cowl flap selector valve was installed on the cockpit sidewall, to the co-pilot's right, forward of the thermo-couple selector switch.

Pressure and return lines were connected from the selector valve to the hydraulic system. To control the time required for opening or closing the flaps, the pressure line was passed through a variable restrictor valve before connecting to the selector valve.

Eclipse Type A-13 supercharger regulators, which operate from engine oil pressure, were installed in place of the original Type A-7 regulators which operate from the hydraulic system. The hydraulic lines running from the bomb bay to the outboard nacelles for operating the original supercharge regulators were used for operation of the cowl flaps on the outboard engines by capping the Tee fittings where the inboard regulator lines connected. This resulted in one continu-

ous line from the bomb bay to the outboard nacelles.

Lines were then installed from the bomb bay ends of the former supercharger regulator lines to the selector valve and from the nacelle ends to the cowl flap cylinders.

These installations provided a complete system for fluid to pass from the pressure system, through the restrictor valve, to the selector valve, thence to the bomb bay, through the former supercharger regulator lines to the cowl flap actuating cylinder. The fluid displaced by the movement of the piston in the cylinder, passed through the other former regulator line into the bomb bay, forward to the selector valve, then through the line connecting the selector valve to the return line from the brake system, and into the hydraulic reservoir.

New lines were then installed connecting the selector valve to the inboard engine cowl flap actuating cylinders. This completed the installation.

With this new cowl flap arrangement, each flap is operated independently and may be locked in any position. The operation may be accomplished either when the engine-driven pumps are supplying the system with pressure, or when the emergency hand-pump is used.

Through Schaefer's development, modi-

fication of B-17Bs at Hendricks Field has been expedited considerably and the operation of the modified Bs has proven more satisfactory. — **Private Charles M. Watt, Air Service Command.**

Link Spin-Delay Mechanism

An attachment for Link Trainers which permits instruction on instrument take-offs is the invention of Technical Sergeant Sherman A. Holbert, Moody Field, Ga.

Heretofore, it was necessary for the instructor to bring the Link out of a spin when it was first started before the student could take over the controls, which meant that the student assumed control of the trainer after it was in full "flight." By the use of Technical Sergeant Holbert's invention, the student is in full control from the time the trainer is started. He can simulate taxiing on the ground and perform a complete instrument take-off.

The attachment is essentially a complex three-way valve which regulates the vacuum applied to both the spin-actuating system of the trainer and the instrument assembly. The key to the successful operation of the unit is the use of an electromagnetic latching device which locks the valve in place at the critical time. — **Public Relations Office, Moody Field.**

periods of mathematical calculations and careful arrangement of the plane or parts for testing.

Giant jacks and cranes hoist planes into testing positions on girder platforms. Shot bags, lead bars, or sand bags are used to simulate actual load conditions of the aircraft in flight. Only after such planes survive these tests, among others, are they adopted for general use by the AAF. — **Wright Field.** ☆



YOUR FRIEND

AIRWAYS TRAFFIC CONTROL

By Lieut. Colonel George C. Price

CHIEF OF STAFF, FLIGHT CONTROL COMMAND

IN the sky over America there is a network of airways that will lead the pilot safely "on course" through soupy darkness to almost any destination he may choose. Proprietor of the network is the Civil Aeronautics Administration which operates and maintains the more than 330 range stations, radio aids, light beacons, and emergency fields and the 23 Airways Traffic Control Centers necessary to the smooth functioning of the system.

Although the Airways were a creation of pilots, by pilots and for pilots, there are many who fly these skyways for months and even years without a clear understanding of the Airways Traffic Control organization and how it works.

Here is a play by play description of some of the facts every pilot must keep in mind as he proceeds on an airways flight.

Suppose you are about to take off from Chicago for Patterson Field, Ohio. You've checked the weather, the notices to airmen, and completed Form 23. Your Form 23 specifies a flight along the airways on contact flight rules and you know that your flight plan has been sent to the Chicago Airways Traffic Control Center for transmission to your destination.

It is important for you to know also that this flight will not be posted on the flight progress boards in the Control Center. The Center pays no attention to CFR flights unless bad weather or other trouble develops in your line of flight. You are flying contact and whether on or off the airways you are expected to fly at the proper altitudes for your heading and keep your eyes peeled for traffic en route.

You take off from Chicago in weather that looks good, meanwhile wondering a little about a front that the weather officer warned you about. Sure enough, the front starts muddying the atmosphere across your line of flight as you proceed toward Goshen, Indiana, and you wish you had filed an instrument flight plan while you were still in Chicago.

The weather won't let you proceed CFR. What can you do now? You can turn around and go back, land at the nearest airport with suitable minimums, or file an instrument flight plan. Since you are a qualified instrument pilot and want to get where you started for, you choose to request an instrument flight clearance.

You tune in on the Goshen Radio Range ahead, well in advance of your arrival over that point. You don't wait until you are over or past the range because radio conversations take time and you don't want to be past the station and out of radio touch with it before your conversation is completed.

What every pilot should know about America's protective flight network.

Goshen Radio jots down your request for an instrument clearance and asks you to wait. Why must you wait? Because a local range station cannot clear you for an airways flight. It serves only as a "go-between" for messages from pilot to the ATC Center and back. The only organization that can give you a clearance is the Center that has jurisdiction over the airways along which you propose to fly, in your case, the Chicago Center.

HERE'S what happens during the minute or two that elapses while you are waiting for a reply. The Goshen Range station operator calls Chicago by interphone and quickly gives the Chicago Center your instrument flight plan. This, of course, tells your position, the time, your present and proposed altitude, your cruising speed, your destination, your estimated time of arrival, etc.

It is also important that you give your proposed route of flight so there will be no mistake as to the exact set of airways you intend to fly.

What happens in the Chicago Center? With a copy of your flight plan in his hand, a traffic controller steps to the flight progress boards in the Center. Here on large boards are posted all instrument flight plans that have been cleared in the area controlled by that center. These boards carry the name of every range station in the area. Under each range station there is a strip of paper representing each airplane expected to report over that station—a strip identifying the airplane and giving all necessary information, including the flight altitude reserved for the flight and the time when your "report over" is expected.

A quick glance at the flight strips under the range station you have named in your flight plan shows the Chicago Center operator that all is clear for your flight. He calls Goshen and Goshen calls you, giving you your clearance to proceed at 5,000 feet and asking you to report north of the Fort Wayne Range for further clearance.

With a sigh of relief you begin your ascent to the 5,000 foot level with complete assurance that you won't cross propellers with other aircraft as you go up and that the 5,000 foot level is reserved for your exclusive use. On instrument flight more than at any other time pilots dislike the company of other aircraft.

All's well. You are sailing along a skyroad all your own toward Fort Wayne. Meanwhile, the Chicago Airways Traffic Control Center has teletyped your flight plan to the Cincinnati Center.

Why were you asked to report over Fort Wayne for further clearance? Because a few minutes out of Fort Wayne you reach the boundary of the Chicago Control Area and enter the Cincinnati Area. The Cincinnati Center may want to move you to a different altitude. As a matter of fact, they do. When you report over Fort Wayne Range, you are instructed to ascend to 7,000 feet five minutes south of the Fort Wayne Range Station and to report when you reach 7,000. You know immediately that the Cincinnati operator sees on his flight progress board that you are getting too close to some other aircraft at the 5,000 foot level. He's pushing you up a couple of thousand

feet to increase this distance. That operator doesn't want to answer all the questions he'd be asked if your plane and another one both tried to occupy the same space at the same time. His job is to keep you well separated and he's on the job every minute.

As soon as you reach 7,000 feet, you report this fact back to Fort Wayne Radio and are instructed to report again ten minutes out from the Patterson Range Station. Fort Wayne radio notifies the Cincinnati Center that you are at the 7,000 foot level and the Cincinnati operator stops worrying about you.

Alt. information concerning your flight is immediately relayed to the center that has you under its control so that the Flight Progress Board will show your exact position. When a plane fails to complete a contact within a reasonable period after its estimated time over a given range station, the Airways Traffic Control Center starts worrying.

Something must be wrong with the

pilot, the radio or the airplane. After a time, a general alarm will be broadcast.

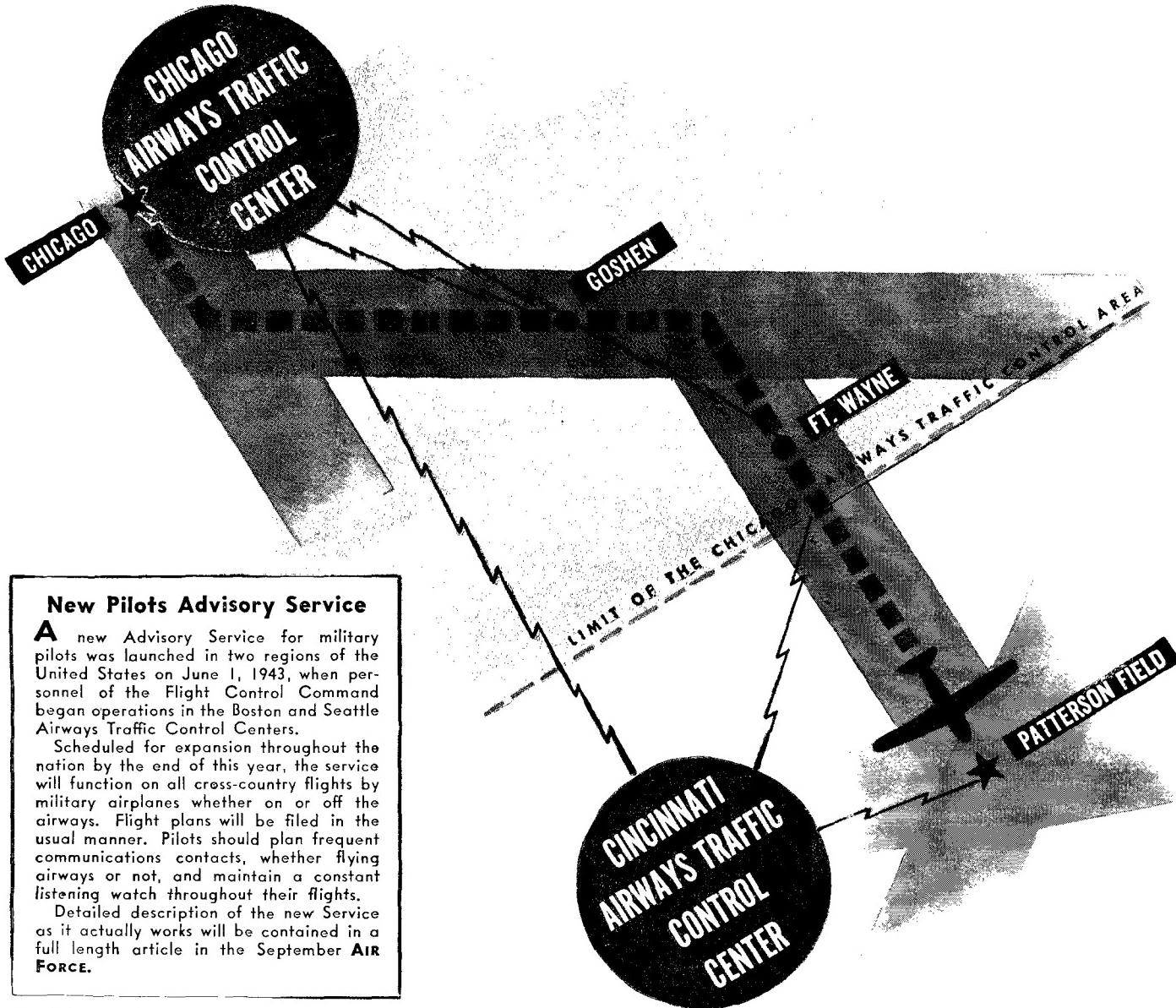
You continue on your flight; ten minutes out you contact the Patterson Range Station. You are notified that ATC wants you to climb to 8,000 feet now and hold on the southeast leg of the Patterson Range. Why, you probably are asking? Because just prior to your arrival six other airplanes arrived in quick succession over the Patterson Range Station and are stacked up at successive 1,000 foot altitudes starting at 2,000 feet. ATC is putting you up on top to wait your turn to come down. As the plane at 2,000 feet is cleared to the Patterson Field tower to land, the planes above are given instructions in succession to descend 1,000 feet. Thus one by one each plane is lowered through the pattern and brought safely into Patterson Field. Your trip on an instrument flight plan from Goshen to Patterson Field is safely completed.

In the Cincinnati Center the picture of the stackup over Patterson Range was clearly shown on the flight progress

board. Each change of altitude is noted for each plane on its individual flight progress strip. ATC knows a lot more about what's going on around you than you do. As each aircraft lands, Patterson Field notifies Cincinnati ATC, which teletypes or interphones the arrival message back to pilot's point of departure.

This streamlined, expertly operated system of Airways Traffic Control is a product of some of America's best aviation minds. Installed and operated by the Civil Aeronautics Authority, it has provided America with the finest network of skyways and navigational aids to be found any place in the world. The average controller feels the tremendous responsibility involved in maintaining safe separation of aircraft that are flying the airways in instrument conditions. The whole plan is one of service that will provide aid and security to all who use the airways.

You, as a pilot, can best do your part by planning your flights carefully, reporting faithfully, and obeying instructions to the letter. ☆





FINAL CHECK. After their briefing, these airmen take a last minute stereoscopic squint at photographs of their assigned targets on Nauru.



FIREWORKS. Smoke and debris (below) billow from the main phosphate plant on the island while other bombs burst in a nearby housing area.



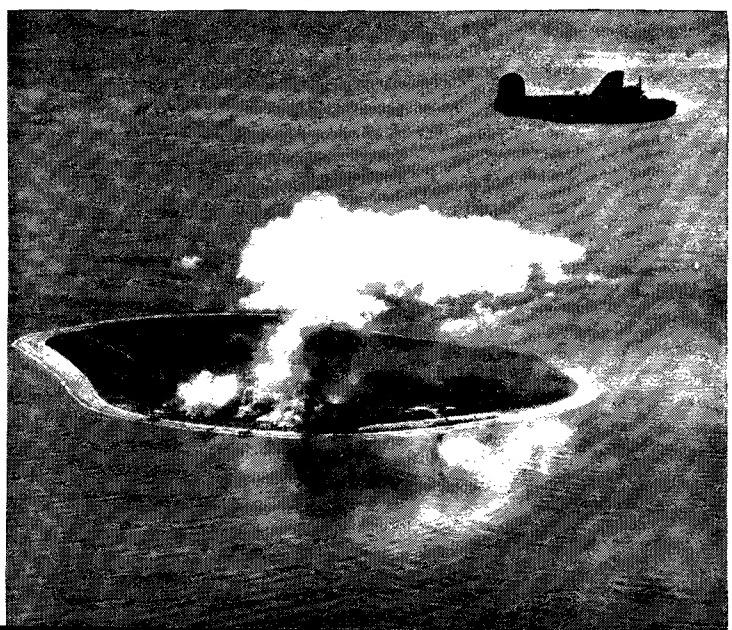
CRATING EGGS. These 1000-pounders were among the tons of bombs the B-24s unloaded over the enemy's island industrial center.

BULL'S-EYE

ONE of the most surprising blows yet delivered by American heavy bombers against the enemy in the Pacific came in mid-April when a large force of B-24s blasted the huge phosphate works on the circular island of Nauru (circumference 12 miles) in the Gilbert Island group. The raid was carried out from Funafuti, largest of the Ellice Islands, which was occupied by American forces several weeks earlier. The Liberators were subjected to intense anti-aircraft fire and fighter opposition but they made their bombing runs "down the groove" and returned safely to their base. From five to seven attacking Zeros were shot down.

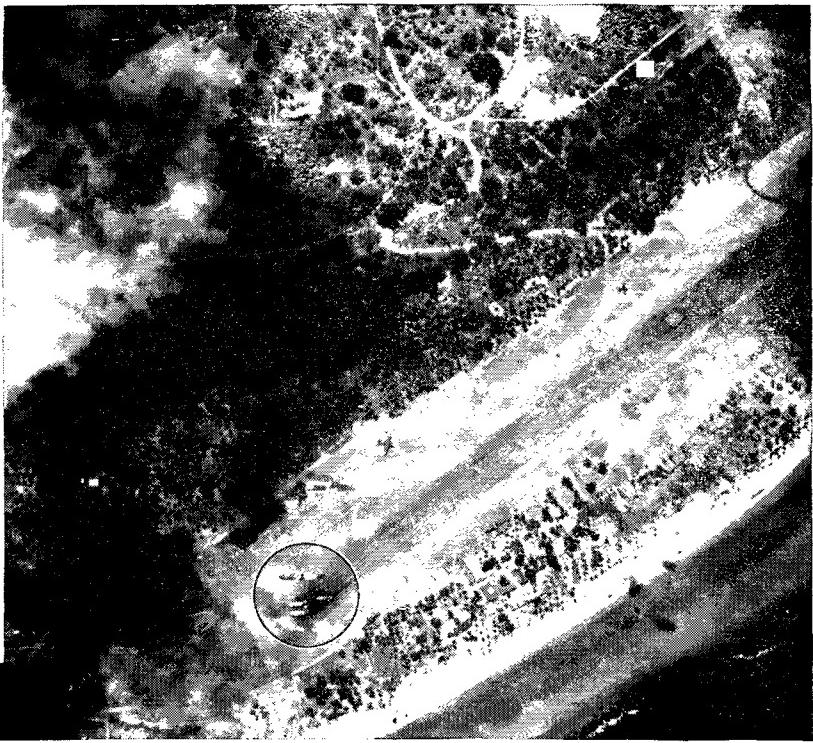
The Japs retaliated the following day with a raid on Funafuti, but the damage and casualties were small compared to the destruction on Nauru. ☆

HOMEWARD BOUND. With the plant area of Nauru Island afire, the B-24s head for their base on Funafuti—mission successful.





ZERO MEDICINE. Armament crews see that the nose turret of a Liberator is well loaded with ammunition before the bombers take off.



FIRST LICKS. An early target was the Jap airfield to hamper fighter interception. Note burning planes.

BOMBING

Show's OVER. Ground crews stand by to count the returning bombers, as the first of the raiders settled to the runway on Funafuti.



HERE'S HOW. Crew members relax around the intelligence officer to report just how it was done.



What's your AIR FORCE I.Q.?



1. How many of the following colors appear on the American Defense ribbon?

- a. Yellow
- b. Red
- c. White
- d. Blue

2. A Peashooter is the name often given

- a. A .30 caliber machine gun
- b. A tail gunner
- c. A fighter plane
- d. An armament specialist

3. Can you fill in the missing words of the Air Corps Song

"Off we go, into the wild blue yonder, climbing high into the sun. Here they come
.....
'At 'em boys, give 'er the gun—
give 'er the gun."



4. The astral hatch of an airplane is commonly used by the

- a. Navigator
- b. Pilot
- c. Radio man
- d. Bombardier

5. The expression, "leading an airplane" is most closely associated with

- a. Taxiing
- b. Landing
- c. Piloting a trainer
- d. Aerial gunnery

6. A chandelle is

- a. The right nacelle of airplane
- b. The lighting system in the fuselage
- c. An external bomb rack
- d. A maneuver in flight

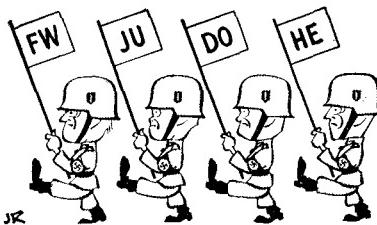
7. Don't look now! Is the Air Corps insignia on an officer's shirt collar worn on his left or right side?

A Colonel we know scored 85 points in this month's AIR FORCE Quiz, which puts him near the head of the class. Credit yourself 5 points for each correct answer and see if you ring the bell with a perfect 100; make a near miss with 90; rock the target with 80; get a passing nod with 70 or wash out with 60 or less. Answers on Page 48.

8. What German airplanes do the following abbreviations designate?

(One wrong is all wrong)

- a. FW
- b. JU
- c. DO
- d. HE



9. The angle of climb of an airplane is controlled by the

- a. Elevators
- b. Ailerons
- c. Rudder
- d. Fin

10. GI is the proper abbreviation for

- a. Government Inspection
- b. Government Index
- c. Government Installation
- d. Government Issue

11. Where does the accent fall on the word "materiel"?

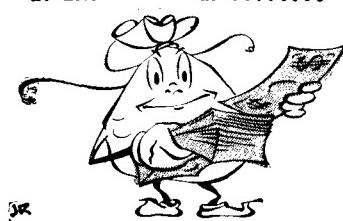
- a. Matériel
- b. Máteriel
- c. Materié
- d. Materiel

12. When halting a squad marching at quick time, on which foot should the command of execution, HALT, be given?

- a. Left foot
- b. Right foot
- c. Either foot

13. There are four forces which act on an airplane in flight. Can you fill in the missing one?

- a. Weight
- b. Lift
- c. Thrust
- d.



14. Army Emergency Relief is available to

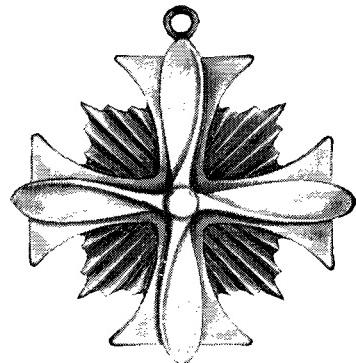
- a. Officers only
- b. Enlisted men only and their dependents
- c. Sergeants only
- d. All members of the Army and their dependents

15. Does the stem of a Major's oak leaf insignia properly point toward or away from his neck?

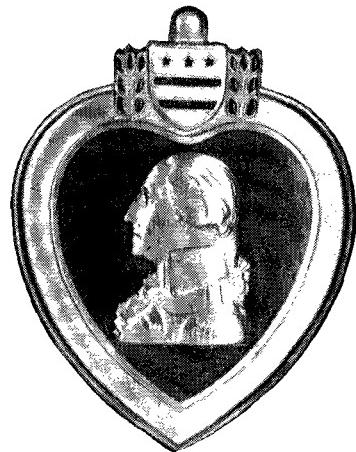
16. 3:30 p.m. regular time is the equivalent of Army time?

17. Which is the Army Air Forces' heaviest single-engine fighter plane?

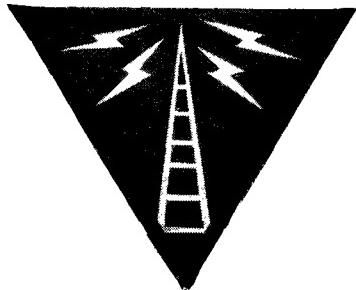
18. Identify this medal



19. Identify this medal



20. Is this Technical Specialist's sleeve patch for Armament, Engineering, Communications or Photography?



How to Keep Well in the INDIAN THEATRE

Brigadier General David N. W. Grant

THE AIR SURGEON



The following is another in a series of articles on health conditions in the various theatres of operation.—THE EDITOR.

INDIA is a strange and colorful land. The customs, dress, language, religious beliefs and mode of life bear little resemblance to anything American. Although in the European section of some of India's larger cities and in the homes of the more wealthy Indians, conditions may resemble those in the United States, constant care should be exercised to avoid exposure to health hazards.

The native quarters of town and rural districts in India are very much as they were hundreds of years ago. There are no safe public water works, sewage is disposed of by the easiest and most convenient means, and foods are rarely inspected to make sure that they are safe.

Over one-fifth the world's population lives in India, an area a little more than one-half the size of the United States.

Practically every disease known to man occurs in this country. Because the uninformed is always likely to meet with trouble, the recognition of the dangers that exist in India is of utmost importance to American troops. Modern military medicine, especially military hygiene and sanitation, has been developed to protect the soldier, no matter what conditions he may be forced to face. If the individual soldier knows what to expect, has a fundamental knowledge of how to take care of himself, and practices ordinary cleanliness and common sense he is able to maintain his efficiency as a fighting man and avoid becoming a casualty due to disease.

Although disease conditions vary somewhat in different parts of India, malaria, "dysentery," the fungus diseases, venereal diseases and snake bite present grave military medical problems throughout the country.

A conservative estimate has been made that 1,000,000 of the 389,000,000 Indians die of malaria alone each year. This

staggering figure indicates its great importance in medical considerations. While the disease is most commonly contracted in the lowlands, where frequently 100 percent of the people have malaria, it is not infrequently encountered in the hill districts.

Every precaution must be taken to avoid this disease because troops suffering from malaria can not be effective as a fighting force. Each man should have a thorough knowledge of the methods of protection against mosquitoes, not only from the malarial type but from all others, for dengue and filariasis, both mosquito-borne diseases, also occur in India. Since it is impossible for anyone other than a trained Medical Department officer to differentiate between disease-carrying mosquitoes and the purely pestiferous types, they should all be considered dangerous.

Although the malaria mosquito usually bites at night, it may be encountered during the day in dense jungles or shaded mountain valleys. When it is necessary to go out-of-doors at night or to operate in a mosquito-infested region at any time, remember to wear long-sleeved shirts buttoned to the neck, long trousers tucked into boots, head nets and gloves. Each soldier should know the value of his mosquito net, how to use it and how to care for it. He should consider it an essential piece of his equipment and should keep it available at all times.

In many parts of India the medical officer will recommend the suppressive or prophylactic treatment of malaria with either quinine or atabrine. This treatment does not prevent malaria in the true sense and consequently can not take the place of the external precautions. However, it does suppress the symptoms of malaria and thus allows a man to carry on until the military tactical situation permits hospitalization. When suppressive quinine or atabrine treatment is once instituted, directions must be followed explicitly or it may

do more harm than good. "Dysentery" is a term used in its broadest sense when applying it to India. Actually the term intestinal disease is more appropriate, because typhoid fever and para-typhoid fever are extremely prevalent as are both amebic and bacillary dysentery. Cholera is another disease that falls in this group of intestinal diseases and commonly occurs as an epidemic, usually during the rainy season from June to October.

All of these intestinal diseases are diseases of filth. They can be transmitted by flies, through water or food, or by physical contact. They can be prevented if the usual sanitary precautions, observed by any clean individual, are carefully followed. The Indian people have little knowledge of, and even more important, less regard for modern sanitation. Garbage and human wastes are deposited in the streets, in the fields and along the banks of streams. Flies are abundant. They breed in waste and, since there is no screening, they have easy access to the kitchen. Streams are contaminated and foods are soiled. Consequently, you must always be on guard. Water should be boiled or chlorinated. Do not trust to luck, drink only water that has been treated by proper Army personnel. Be sure that the kitchens where your food is prepared and the places where you eat are free of flies.

Since treated water may not be available at times in India, every soldier operating in this area should know one or more methods of purifying water (FM 21-10). If he has no chlorine or iodine he should always remember that boiling water is one of the easiest and surest methods of purifying it.

Because the rate of exchange is favorable and wages are so low in this part of the world, Americans frequently hire native boys to cook, run their errands, do the laundry and perform other menial tasks. These boys may appear clean and

may be intelligent. However, do not trust their knowledge of sanitation and hygiene, for their customs usually are the same as their forefathers. Personally supervise everything they do until you have thoroughly trained them. See that a medical officer examines them and says that they are not infected with a communicable disease. Make certain that they wash their hands with soap and water whenever they are soiled. See that they prepare your food exactly as the Army prescribes. And above all, be sure that the supplies that they purchase for you are safe.

Native fruits and vegetables are dangerous. The safest rule is to eat only thoroughly cooked foods. Soaking fruits or vegetables in potassium permanganate solution is not satisfactory unless they are soaked for four or five hours. The very few dairy products existing in this area are not safe to eat. Raw or dried fresh water fish, crabs and crawfish, as well as the water chestnut, should not be eaten unless they are thoroughly and carefully cooked. They transmit the dangerous lung fluke.

One should never walk about barefoot in India. Fungus diseases, such as athlete's foot and dhobie itch, are very prevalent. They are seldom fatal but they can cripple a man and make him a liability to a fighting team. These diseases are easily prevented by bathing frequently and keeping as dry as possible. Dry all parts of the body thoroughly with your own towel, not with a towel that has been used by someone else. Be especially careful to dry between the toes, in the groin and under the arms. Dusting the body with powder, such as Army issue foot powder, and changing to dry clothing as often as possible are additional methods of preventing these diseases. During the "rains," even though precipitation is not continuous, the humidity makes it very difficult to stay dry. This calls for extra precautions.

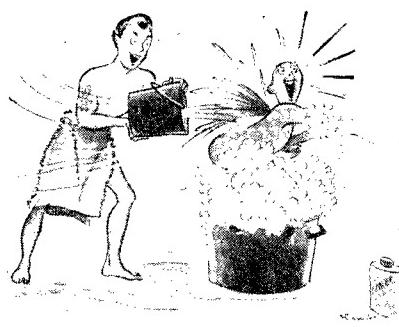
Fungus diseases can be transmitted easily from one individual to another when the clothing of a man suffering from a fungus infection is washed with the clothing of others. It is best to do your own laundry or to see that mixed clothes are boiled.

Because of the difficulty in keeping dry, minor wounds such as leech and insect bites, scratches, cuts and burns which would be considered trivial at home, become easily infected. No matter how slight a wound appears to be, it should always be thoroughly cleansed and treated with an antiseptic.

The jungle country of India is inhabited by many animals and insects that may be dangerous to man. Although most of them will go to great lengths to avoid man, they may become dangerous when threatened. The buffalo and bear are perhaps the most dangerous animals to be encountered. The buffalo has been known to attack man without provocation.

If large cow-like tracks are seen on the trail, move warily, try to avoid attention if a herd is sighted, and prepare to climb a tree if attack seems imminent. Curiosity may draw a tiger or elephant to a camping place so it is well to keep a fire burning all night. Animals are not likely to investigate a mosquito net closely because of the human scent and fear of a trap, adding value to this flimsy protection. Elephants show their presence by the damage done to the forest. If a clearing shows signs of these animals do not make camp, because you may be taking over a regular resting place for a herd. When shot, all animals should be regarded as dangerous until they display no further signs of life.

Several types of crocodiles are found in the Ganges system of rivers and along the east coast of India, and sharks abound along the entire coast line, so it is necessary to exercise caution when swimming in strange waters. Scorpions, spiders and centipedes are common in India. The sting of some of these pests, although practically never fatal to an adult, is extremely painful and may prove incapacitating. Ants, hornets, wasps, mites and the small stingless sweat-bee are annoying



pests. There are two types of leeches to watch out for in India, the large, dark horse leech in fresh water, and the small, red jungle leech on shrubs and jungle grass. Although leech bites are not dangerous, they frequently become infected and lead to painful chronic ulcers. A leech should not be pulled off the skin. They can be easily removed by touching them with a lighted cigarette or prodding them with a knife. The natives of this part of the world frequently remove leeches by touching them with a small sack of moist salt which they carry tied to the end of a stick.

Ticks are not uncommon especially in the jungle areas. One variety of tick carries a disease somewhat like our Rocky Mountain spotted fever, known as "Indian Tick-Typhus." When traveling through tick-infested country, tuck your trousers in your boots, and do not lie down in the grass unless absolutely necessary. Remove your clothing two or three times a day and search the body thoroughly for

ticks. Never remove a tick with your bare fingers. Place a piece of paper or cloth about the tick before touching it, or remove it the same way as a leech—with a knife or a lighted cigarette.

India reputedly has more deaths from snake bite than any other country in the world. Poisonous snakes frequently live close to human habitations which they visit at night in search of food. Since on cool nights snakes like to get into warm places such as shoes and clothing, all clothing and shoes should be carefully examined in the morning before getting dressed. Before getting out of bed at night turn on a flashlight to make sure that there are no snakes on the floor. Always look in cupboards, drawers and other dark places before reaching in with your hand.

If bitten by a snake, the patient should be kept quiet and medical attention obtained as quickly as possible. Do not give the patient a drink of whisky or other alcoholic beverage, and do not permit him to exert himself. Follow the procedure set forth in paragraph 128, FM 21-10. Start the treatment immediately. If the bite is on an arm or leg, apply a tourniquet just above the bite. This tourniquet can be made from a neck tie, handkerchief, bandage, piece of string or vine. A cross incision, one-half by one-half inch, should be made over each fang puncture. These cuts should be from one-quarter to one-half inch deep. Suction should then be applied for at least 30 minutes. This may be done by either sucking with the mouth or by heating a bottle and applying its mouth tightly over the wound. When the bottle cools, considerable suction will be produced. If any cracks or sores are present on the lips or inside the mouth, place a small square of rubber over the wound and suck on it to avoid having the snake's venom come in contact with the mouth.

Every type of venereal disease is present in India. Syphilis, gonorrhea and chancroid are especially prevalent. Professional prostitutes are nearly always infected with one of these diseases. The great majority of clandestine pick-ups are also likely to be carriers. The soldier who has been exposed to these diseases should go immediately to the nearest Army prophylactic station or, if one is not available, use a chemical prophylactic kit. Mechanical prophylaxis should always be used.

Leprosy is widespread in India but it is not as easily contracted as many people believe. Avoid actual physical contact with a leper and there is no danger of getting this disease.

Trachoma, a very serious disease that leads to blindness, is common in all parts of the country. This is a disease of filth, and may be avoided by refraining from rubbing the eyes with soiled fingers. It can be transmitted from one person to another by means of a common face towel. ☆

"IRON ASS"

By
Captain B. W. Crandell
EIGHTH AIR FORCE

THEY used to think their C.O. was a slave-driver, a hard, unyielding, unsympathetic man. "Iron-ass" was the name.

There were other descriptions, too, of this B-17 group commander during those two sweltering months back in the States when he was whipping his combat crews into shape.

But here at a bomber station "somewhere in England" the same men call him "absolutely the best C.O. in the Army."

The story of the transition is an interesting one. It was a transition not of the C.O. but of his men.

They know him as the rare paradox of a commanding officer who almost never talks while he's working. But, when he does take a long puff on his cigar and opens his mouth, he's to the point; he has the final answer and only answer, because it has been thoroughly thought out.

This characteristic brevity, and the restrictions he slapped on them when he was desperately attempting to get them trained for combat, resulted in the "iron-ass" reputation right off the bat. They had their reasons for calling him that; he had his for being that way.

When he first took command of the Group it had four battered B-17s, a few experienced pilots, almost no experienced navigators, bombardiers, radio men or

working on a 24-hour schedule, squeezing every minute of training time into them that was humanly possible.

They didn't like it then. It was no gentleman's way to go to war. They cursed and sweat, then cursed some more. But they flew, far into the night—bombing practice, gunnery, navigation, formations and the myriad things a group must know before tackling the Luftwaffe. Their C.O. drove them, day after day, for two months.

He kept it up when they arrived in England, restricting everyone to camp for three weeks. It was the only recourse. A mountain of work lay ahead and it had to be done immediately. British radio procedure, aids to navigation, aircraft recognition, more gunnery and bombing practice, and a hundred other necessary items.

It was his theme of "work and more work" that he promised would pay dividends. And it did.

On the first five of the Group's missions not a Fortress was lost. The Commanding Officer went on them all, taking over different positions in the crew. Once he was pilot, another time co-pilot, and on one raid he was in the top turret manning a pair of caliber fifties. He made it his job to understand the problems of each man he ordered into combat.

Among other things, he taught them a new formation. It was born in a bit of psychology.

He ordered up the Group on a training flight one day and, before the pilots knew that they were participating in an important experiment, they were obeying directions coming over the radio.

"In a little closer, Martini—stay at that height, Pyle—put your squadron higher and to the right, McGeehee—get more space between elements, Preston . . ."

It went off smoothly, the C.O. reports, but adds that he doesn't think it would

have been smooth if he had told them before hand that they were going to try something new and difficult.

The experiment proved that Fortresses could fly the formation, which on paper seemed to him the best defense against enemy fighters. Although he claims the formation is "nothing new—just an adaptation of the old stagger formation—it has achieved new results for high-altitude warfare in this theatre of operations.

The Group has suffered the comparatively low loss of thirteen airplanes on 25 missions including the March 31 raid, and two of the Forts lost to enemy fighters were first forced to drop out of formation because of mechanical trouble.

Along with this tight defense, the C.O. drills the gunners to start shooting at enemy fighters, if possible, before they dive in to attack at close range. It has the same effect as a boxer's left jab. Popping away at the Focke-Wulfs and Messerschmitts while they're waiting for a break keeps them off balance.

"I don't care how few fighters you knock down," he reassures them. "Keep them away from the formation."

The Group is proud of coming home with few claims. For their C.O. continually tells them that their primary purpose in the war is to pick up a load of bombs and drop them on the target. This indoctrination has had other results, too.

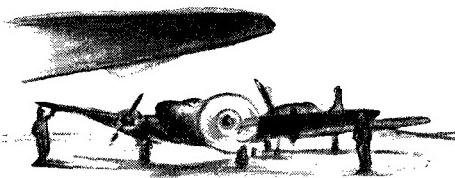
The Group has had fewer "abortive" aircraft—those Fortresses which take off but return to home base without dropping their bombs. There always are good reasons for "abortives," but the men have better reasons for hitting their mark.

New adaptations of this tight, deadly formation to meet new enemy tactics, are continually changing the original pattern.

"We've got to keep a step ahead of the Luftwaffe," he says in one of his rare moments when he expresses the obvious.

Although policy now is against commanders going on all missions, he always goes when a new target, or new risks, are involved. The first raid on Germany, for instance—

(Continued on Page 44)



gunners. And only two months to prepare for the "major league." The first thing was to get the airplanes and crews



WE INTRODUCED THE JAPS TO THE B-26

By Major Dill B. Ellis

OUR flight of five B-26s was on a mission to bomb a Jap airdrome at Lae. We went in at 1,500 feet, laid our bombs in the dispersal bays alongside the runway, swung out over the harbor and were suddenly jumped by fifteen or twenty Zeros.

One of our planes was badly hit and it "went in." The remaining four of us poured on all the coal we could and kept low over the water. Soon I felt my own ship, which was the lead plane, swerve heavily. The pilot of a plane behind me radioed that my right wing was afire. A 20 mm cannon shell had put a hole in

the wing that you could have stuck a boot through. But we were still flying and the flame in the gas tank soon went out.

Just then our navigator, Lieutenant Leon Kallina, tapped me on the shoulder. I presume he was going to tell me about that right wing. Before he could speak he fell and I sent Lieutenant B. B. Moore, my co-pilot, back to find out what had happened. Kallina was dead. A machine gun bullet had gone right up through his chest as he stood behind me.

By the time the co-pilot returned to his seat, a Jap fighter had attacked from the front and riddled the nose of our ship.

Our bombardier, Lieutenant R. E. Falls, had been seriously hit. Falls, however, was still able to stay on his guns and he got the Jap fighter. That was a satisfaction, believe me.

Some of our other planes were also having a bad time. A ship flown by Captain J. C. O'Donnell had probably suffered most, with one engine completely knocked out. The Japs, realizing he was crippled, swarmed around him like bees. But his tail gunner was a very cool customer named Corporal Henderson who knew a couple of tricks himself. Henderson, pretending his guns were

"The B-26 is every inch a warplane," says this combat pilot, who tells why the Japs think so too.

jammed, openly invited a rear attack. Every time a Jap fighter accepted the invitation, Henderson would get him with a quick burst. He brought down three Zeros this way while the plane was flying along on one engine.

The Zeros chased us 100 to 125 miles down the coast before they turned back. We still had to cross the Owen Stanley Mountains to reach our base at Port Moresby and this, in itself, was a problem.

There was one short-cut but it was through a high pass in the mountain range and it seemed unlikely that O'Donnell's ship with one engine gone—could make the altitude. On the other hand, I had a badly wounded man aboard and my gas was going fast.

I gave orders for the other three ships to stick together and fly back to Moresby by way of a low pass further along the range, while I took the short-cut.

HERE we got into more trouble. Two Zeros that had been on a raid against Moresby were using that high pass themselves and jumped my ship. As luck would have it, not a single man of our crew was on his guns at the moment. They were all in the tail, taking care of the wounded bombardier.

I didn't know this, of course, and turned right into those two Zeros. They didn't know it, either, and broke away without firing at us. We returned to Moresby without further incident and a little while later were joined by the other three crews. All our planes were badly shot up—it was a day when you thanked Heaven for self-sealers—and we had lost one ship. But we had brought down either seven or eight Zeros.

This was typical of the many active days our medium bombardment group wrote into its record of operations. This happened to be on May 28, 1942, but it was only one of the many calls we paid on Lae, Rabaul and Salamaua.

We had set out from the United States in February. Our B-26s were transported by ship part way across the Pacific and flown from there, island by island, to Australia. The group began operations in April.

We were stationed at Townsville, running most of our missions from Port Moresby. The airfield at Moresby was pretty rough in those days. The runway was made of dirt and gravel and had a slant to it. You took off downhill and landed uphill. And, since it was being pounded rather regularly by the Japs, you

had to be careful of the soft spots—the places where bomb craters and shell holes had been filled in. However, it was 4,700 feet long, which gave us plenty of room and later the runway was leveled and equipped with a mat.

All our crews had had a lot of time in B-26s, particularly during the Louisiana maneuvers, and our ground men had learned how to maintain the ships under difficult circumstances in those same maneuvers. This helped enormously and was one of the reasons, I am sure, why our group had relatively low losses.

During the first eight months of our operations we flew always without fighter protection. In addition to the raids against Rabaul (although this was later abandoned as too long a mission for efficient use of medium bombers), Lae and Salamaua, our group took part in the Milne Bay and Coral Sea actions, and was very active throughout the whole Buna campaign. From the time that Jap ships unloaded troops on Papua until, months later, they were driven back across the Owen Stanley Range and finally eliminated from the whole area, we were busy attacking ships, storehouses, ground troop concentrations, the airdrome at Buna and other medium bomber targets. Sometimes we flew two missions a day.

In the course of these and other operations our group shot down more enemy aircraft than any other medium bomb group in the Army and now stands, I

believe, either third or fourth among all bomb groups in this respect.

Our early success against Jap fighters was due in some measure to the fact that they had never seen B-26s before.

It's a tough ship to be introduced to, even though the planes we had were not nearly as heavily-gunned as the current model. The Japs had quite a time deciding upon the best approach.

Jap fighters experimented diligently in their attacks upon us until they found what they evidently believed was an advantageous approach, which thereafter they adhered to religiously.

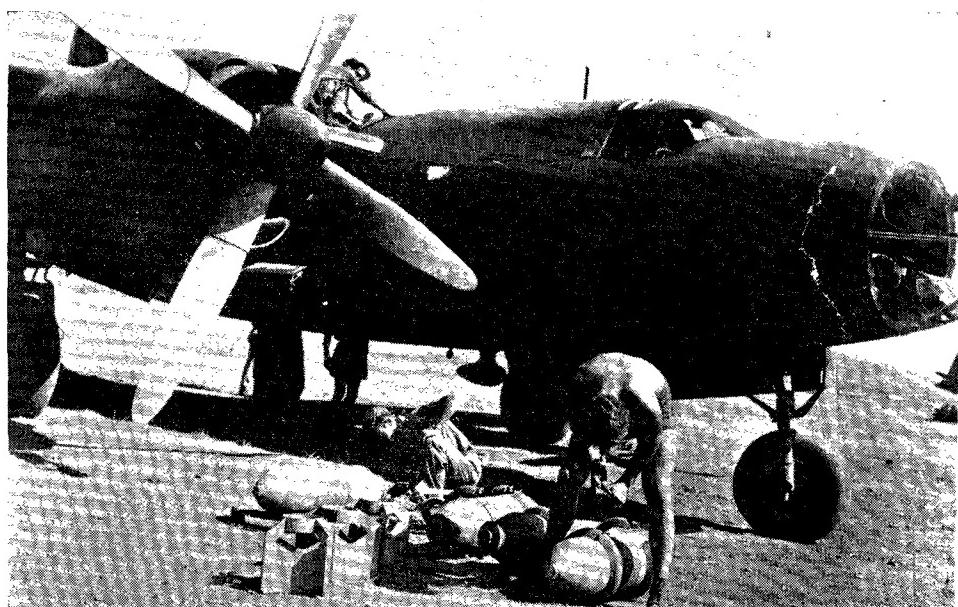
They *always* continued to show us plenty of respect, however, and with good reason.

The B-26 is every inch a warplane. It has speed, heavy armament and sturdiness.

Speed, of course, is a great virtue. While in a long chase Zeros will frequently be able to make several attacks, there are many occasions when this is not the case. I remember a day when I was jumped by seven enemy fighters and they had time only to make one pass before I found cloud cover and got away. This speed—together with the fact that the plane is so maneuverable that it can be handled like a pursuit ship in many respects—is a tremendous asset in combat.

And so is the ship's strength. It will take a terrific beating and generally get you home somehow, unless you yourself are put out of commission. Even then, there's still a chance. The crew of a plane in our group once was severely shot up while attacking a Japanese ship. Both pilot and co-pilot were disabled by gun fire, one being unable to use his legs, the other unable to use his arms. By working together, however, they brought in the plane for as nice a landing as you'd ever want to see. ☆

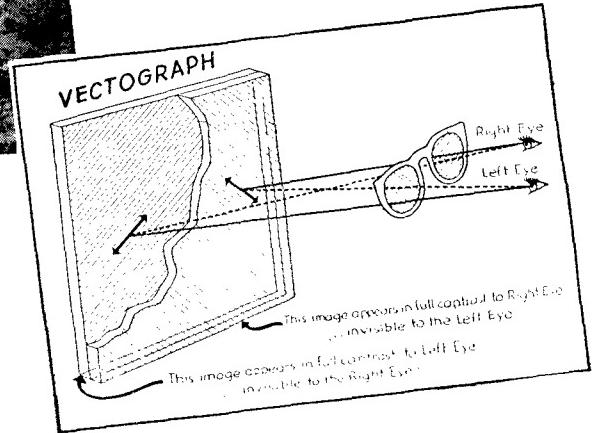
Loading a B-26 at a Port Moresby base prior to a raid on New Guinea was a scene that was often duplicated in the author's squadron.





All you need out in the field to get a third-dimensional perception of a reproduction of enemy terrain is a Vectograph print and a pair of polarized spectacles. The Vectograph principle is illustrated in the figure at right. Light polarizers in the print and spectacles, crossing at right angles, give the double-image Vectograph the effect of depth.

DEPTH PERCEPTION SIMPLIFIED



By Lieutenant Colonel M. E. Parks

HEADQUARTERS, ARMY AIR FORCES

CREW members of a bombardment group gather in the briefing room. The briefing officer snaps out the lights and flashes a lantern slide on the screen. The slide shows a piece of enemy terrain, but it has the typical hazy appearance of a double exposure and, with the naked eye, it is somewhat difficult to identify. The men in the room then put on what appear to be ordinary dark sunglasses and the reproduction comes to life. The picture actually takes on *depth*. That tree-bordered stream snaking across the terrain shows up, not as a stream, but as flat paint disguising an enemy airfield. Strictly a camouflage job. And that patch of woods. More camouflage. The trees slope upward in tell-tale humps that mean not woods at all but a couple of camouflaged hangars. Now the crew has its target.

Three-dimensional pictures of this type are now being made by Air Force photographic units. They are called Vectographs. Aside from their double image appearance without the glasses, they look and handle much like ordinary photographs and are just about as convenient to use. As projection slides they can be viewed by an entire group with the aid of only simple Polaroid Three-Dimensional Picture spectacles. Even handier, Vectographs can be made up as prints to be held in the hand, hung on the wall or

mounted in book form for detailed study.

The three-dimensional picture principle is not new. In the first World War photo intelligence officers used three-dimensional methods on aerial photos to dig out information that could not be obtained from ordinary flat pictures. But the job required the use of two paper prints, a stereoscope made up of mirrors or lenses and a work table, and the employment of considerable patience and even greater skill. The stereoscope still represents the best method of obtaining quick three-dimensional views of aerial photos but expert handling remains a prerequisite.

What is new about the Vectograph is that it provides an easy way for non-experts to benefit from three-dimensional views and permits mass reproduction of such pictures for new and important uses.

THE Vectograph also affords a much larger view than the stereoscope. In addition, photo labs may piece together any number of these separate area views into a "model" of hundreds of square miles of territory to serve as quick substitutes for maps or to show information that maps cannot present. These big Vectographs can be studied by a number of people at once, whereas the stereoscope is strictly a one-man show.

This new method is now an established

service in the AAF, the Navy, Marine Corps and the RAF. Air and ground force groups in the South Pacific, the Aleutians, Africa and Britain are having them made up by photo units already trained and equipped to do the job.

The Vectograph employs a simple principle. By placing your hand over one eye and looking around, you can see that it takes two eyes to get a true three-dimensional view. For the same reason, it takes two different pictures— one for the right eye and one for the left eye of the observer— taken from two different focal points, to make a three-dimensional picture. Furthermore, your eyes have to pick up these two different images at the same time and see them as if they were in the same place. They must be shown so that the right eye sees only the right-eye image and the left eye only the left-eye image, while the brain fuses the two into a single three-dimensional picture.

With the Vectograph, the two images required for the three-dimensional picture occupy the same piece of the special Vectograph sheet, one image right over the other, without interfering with each other when viewed through polarizing spectacles.

This can be accomplished because the Vectograph image is rendered in terms of "degree of polarization" rather than in pigment, dye or silver particles.

The Vectograph sheet has two sides, both actively engaged in the job. The printing solution converts the film surfaces into light polarizers, which behave as if they were made of optical slots. Light is blocked by a pair of polarizers whose slots cross at right angles with resultant blackness. On the other hand, light is passed most easily by a pair of polarizers with parallel slots. As a polarizer, each face of the Vectograph film acts as a set of optical slots. The viewing spectacles contain polarizing eyepieces. In combination, the spectacles and the polarizing Vectograph images create and control the pattern of blacks, whites and grays which the eyes see. To separate the pictures, one for each eye, the optical slots of the two Vectograph polarizing images cross at right angles; the lenses of the viewers are similarly arranged. Each eye is matched up with its corresponding image.

Without the glasses, the Vectograph print, held in your hand or projected on a screen, looks like a fuzzy double-exposure. With them, the two images on the sheet are unscrambled so that each eye gets its own perfect image to look at and combine with the other into the single depth view.

Pictures of machinery, guns and other training subjects may be made with a special double camera taking the two views at once, or a regular camera, such as the Speed Graphic, taking one picture from one point and moving sideways a few inches before snapping the other.

The Vectograph with its polarizer principle was invented by Edwin H. Land, president and director of research of Polaroid Corporation, working with Joseph Mahler, a specialist in methods of

The scope of photo interpretation has been broadened by this new third-dimensional technique

three-dimensional presentation. The process was announced late in 1939 and quickly developed into practical form for war use with the encouragement of the AAF and other branches of the service.

A first-quality clothes wringer is the most elaborate piece of special equipment used in making Vectographs.

The process starts with a pair of stereoscopic negatives obtained by any of the usual methods. Here aerial photography has a great advantage over visual observation. A pair of photographs made with standard sixty percent overlap gives the effect of spreading the eyes as far as the camera stations are apart, greatly heightening the scale of relief. Terrain that looks perfectly flat to an aerial observer appears in full relief in the Vectograph.

ANY of the standard aerial cameras can be used, and there is no special trick in taking the pictures. The aerial photographer simply follows the regular rules for making reconnaissance strips.

He prints the negatives photographically on Eastman Washoff Relief Film, the same film used for making color prints, and then soaks them briefly in a special printing solution, inserts the Vectograph sheet and runs the sandwich through the wringer. The images begin to appear and, in less than a minute, they are complete. He next strips off the relief films from the Vectograph and sets them to soak for the next print. (The

process is detailed in T.O. 10-25-23.)

Selected AAF photographers take only a week's post-graduate course to add Vectography to their regular bag of tricks.

After two practice runs through the process, they are usually able to start with a pair of negatives and turn out a print, dried and trimmed, in about thirty minutes. Succeeding copies take about one man-minute apiece. The process can be carried out in any place that can be darkened—the Air Force standard trailer, a blacked-out truck body, any base or field photographic unit. Service personnel already have been turning out Vectographs of satisfactory quality under field conditions in the combat theatre.

Although new uses for Vectographs will arise from time to time, their principal military value may be summed up as follows:

Briefing combat teams, such as bomber crews, assault parties, landmining groups, engineers, air support groups, ship-to-shore artillery units and parachute troops.

Staff work—for tactical planning over unmapped or sketchily-mapped territory.

Intelligence reports—for conveying intelligence information to field officers who need not be equipped with stereoscopes in order to be thoroughly familiar with the location and appearance of enemy supply depots, dumps, road crossings, bridges, communication bottlenecks, fortifications, the effects of bombing and shellfire, disposition of enemy artillery and desirable target objectives.

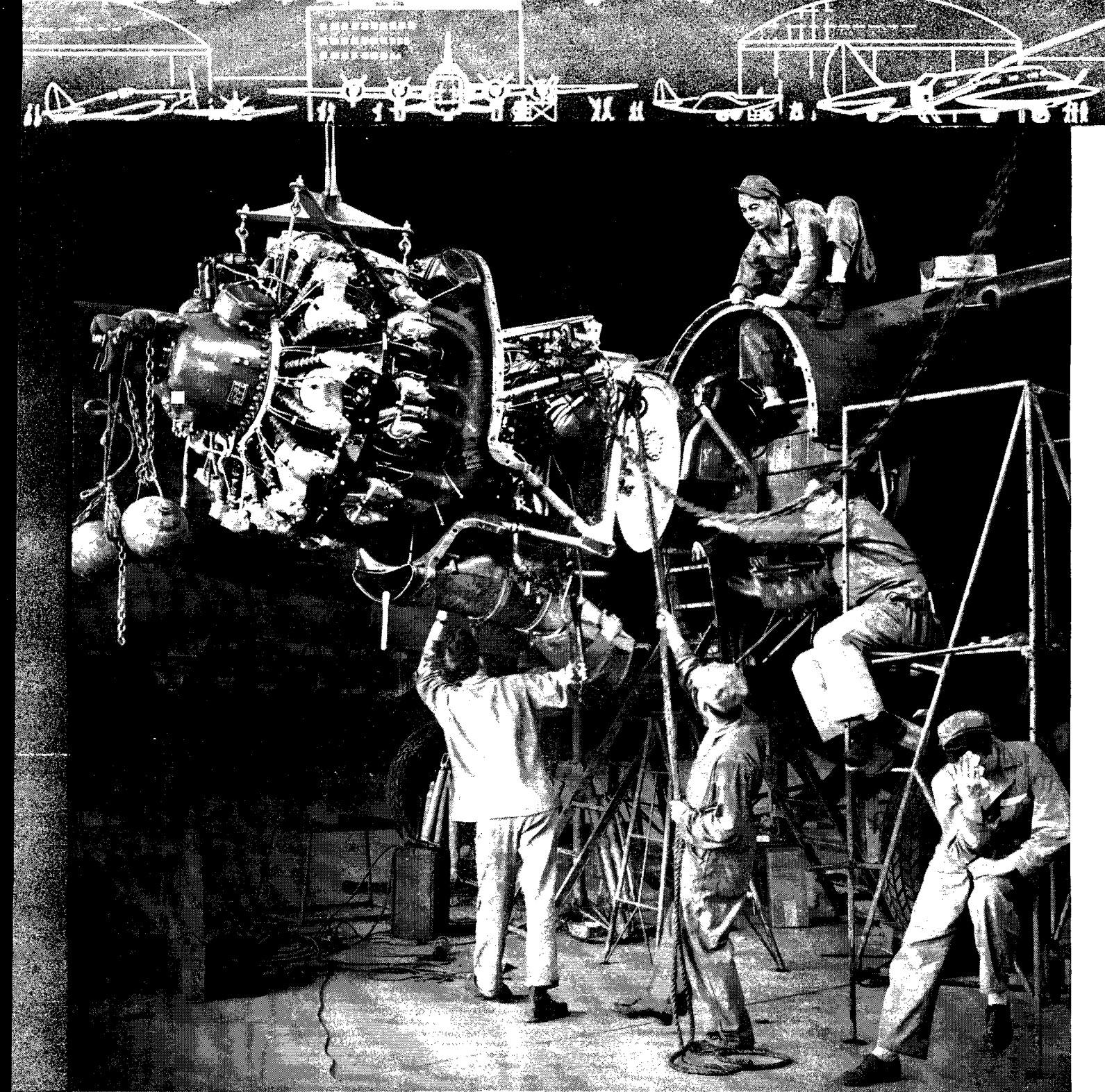
Training large classes of student mechanics, gunners, navigators, pilots and other personnel who must assimilate a lot of information rapidly on subjects and devices that are difficult to understand from a flat picture. ☆

Here's how a Vectograph slide of a target area may be viewed through third-dimensional glasses by a number of people at the same time.



There's only one girl in this picture. It's the Vectograph, plus a couple of mirrors, one on the right and one in front of the girl, that has you seeing double or triple or quadruple. This is a photograph of a Vectograph print, with its hazy, double-exposure appearance to the naked eye. Through the Vectograph spectacles held over the print, you will note that the legs and arms of the mirrored image at the left appear smooth and in focus, while the shoulders and face do not. Similarly, the panel back of the girl at the right shows up single in the right lens of the spectacles and double outside. You actually are seeing a different picture through each of the lenses. If you had the opportunity to look through these glasses at the Vectograph print, the combination of the two images, one seen by each eye, would produce the third-dimensional effect. And it isn't bad, either.





WHAT'S WRONG WITH THIS PICTURE?

H'M. Better ask what's right about it.

We might more appropriately use the title "How NOT To Change An Airplane Engine." Nine specific mistakes in the picture, listed on the opposite page, were pointed out for us by Private First Class Alfred Purinton, who is the mech tugging on the rope. Did he miss any?

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This example of how not to change an engine was posed in the interest of better maintenance practices by men of the Air Service Command. They are members of the 88th Repair Squadron of the Fairfield, Ohio, Air Depot, Control Area Command. Left to right, they are, Private Frank De Chirico, Privates First Class Purinton, Ruben Wetherell and William Wharton; astride the nacelle is Private First Class Noah Reese.

AIR FORCE, August, 1943

ON THE LINE

MISTAKES ON OPPOSITE PAGE

Reading from left to right

1. Just notice, will you, how all those scattered tools and unnecessary equipment clutter up the mechs' working space. This greatly interferes with efficiency in maintenance procedure and creates many hazards to safety.
2. Weights on the prop shaft should not be used (unless a sling isn't available). Two weights do not hold the engine in correct position for installation, yet a third weight might distort the prop shaft. A sling is the thing. Reference: T.O. 02-10GA-2.
3. Sooner or later someone of you five mechs is going to be looking high and low for that ratchet wrench. See it? It's there in the oil cooler air scoop. Every tool in its proper place is readily located — no time ON THE LINE for a game of "hide the wrench." The same thing applies to the rod in the aperture of the leading edge of the left wing.
4. Never, never, stand under an engine. There is not written guarantee that an engine won't drop from its hoist.
5. The engine mounting bolts are in backwards, fellows. You'll find out you can't install an engine this way. Reference: T.O. 01-1-58.
6. What is this anyway, tug of war? You, pulling at the rope, you're wasting manpower. The chain attached to the engine mount is another superfluous operation. Both mistakes should be eliminated by using the sling already mentioned. Never use a heavy chain for guidance because of the danger of smashing tubing, conduit and junction boxes. Also, the chain might swing backwards and puncture the tank; more important if it falls, it might kill a mech.
7. Hey, you up on the nacelle. You're about to commit four unpardonable boozers. You're swinging foot can rupture the fluid lines. When the engine fits into place your leg will be mashed between the tank and the firewall. You might kick that block off the wing with your left foot. The fingers of both your hands are in a swell position to be smashed.
8. The maintenance stand on the right is improperly placed. It should be closer to the plane to provide safety for that mech reaching toward the engine.
9. Look out for that ratchet wrench just ready to drop off the maintenance stand. And it's right in line to fall on the head of your buddy.
- P.S. You might conclude that the dejected mech with his handkerchief to his head is deplored the messy job in this picture. But it's even more serious. He's a victim of the August heat, largely because he forgets to take those salt tablets and plenty of water. But we won't count this one against you.

TAXI ACCIDENTS . . .

Many taxi accidents are caused by improper care and checking of brakes. On inspection of several airplanes that were damaged in taxi accidents recently, one was found to have an 0.110 inch clearance in the brakes. While taxiing another of the airplanes the accident officer found that the right brake failed twice during a test involving about twenty stops and turns. One failure is one too many. Brake clearances should be checked every fifty hours and the system kept free of air.

And don't forget that airplanes should not be taxied from the maintenance line. Push or tow them into the clear before starting the engines for taxiing.

PICK UPS . . .

At a southern airbase, an inspection disclosed enough nails, screws, and other assorted bits of metal lying loose on the flight line to give any salvage drive a substantial boost. Damage to tires and tubes of airplanes taxied over an improperly policed area may have dangerous after-effects. Lives of pilot and crew may be jeopardized. Would you feel your feet were safe from cuts if you walked barefoot around your apron and runways at night?

IN THE COCKPIT . . .

Remember that placards placed in cockpits calling the pilot's attention to important information are useless unless he can *read* them. If the signs are badly defaced or deteriorated, see that they are replaced by new ones.

CHECK THIS . . .

Learn the location of the main fuel line strainers on gasoline servicing trailers. Have the proper dust cap on fuel servicing nozzles. And is data of inspections stenciled on the side of the trailer?

IT HAPPENED IN SAN JUAN . . .

Not so long ago on the tropical island of Barbuda in the Antilles, a British pilot made a forced landing. Ingenuity of three AAF men enabled him to take off again in short order.

First Lieutenant Daniel R. Kelly, Technical Sergeant George L. Hilton and Private Ralph W. Alford neared the scene of the wreck with an Army crash boat.

A monthly maintenance roundup prepared in collaboration with the Air Service Command and the Technical Inspection Division, Office of the Air Inspector.

Despite bad weather they wound through dangerous reefs, followed a narrow jungle path and found the uninjured pilot.

Without facilities of a modern depot and machine shop, the men foraged a propeller and carburetor from a small plane. They spliced front and rear struts with an oar from the crash boat, using tent pegs and screws from the boat's supply. A bent eye-bolt on the rear spar was straightened after it was heated over a small gas stove.

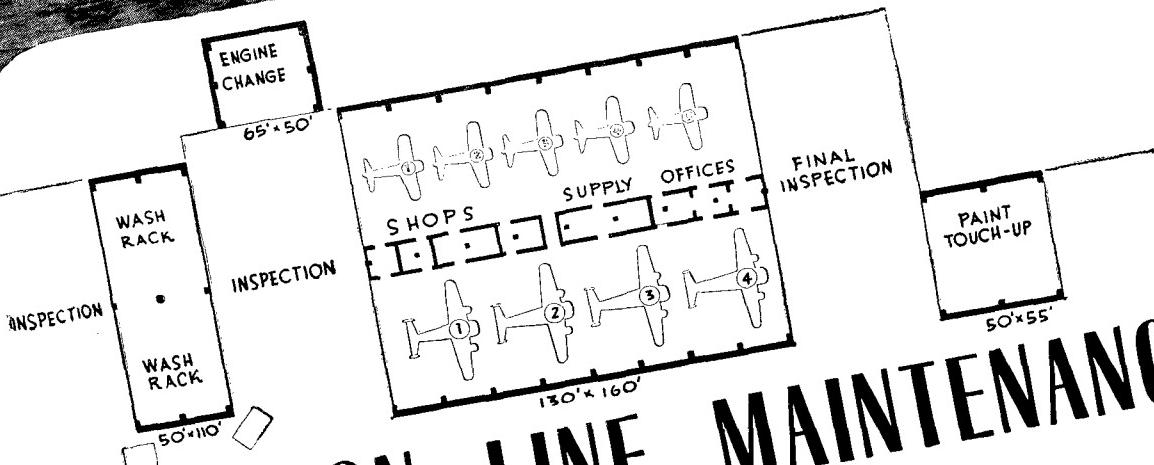
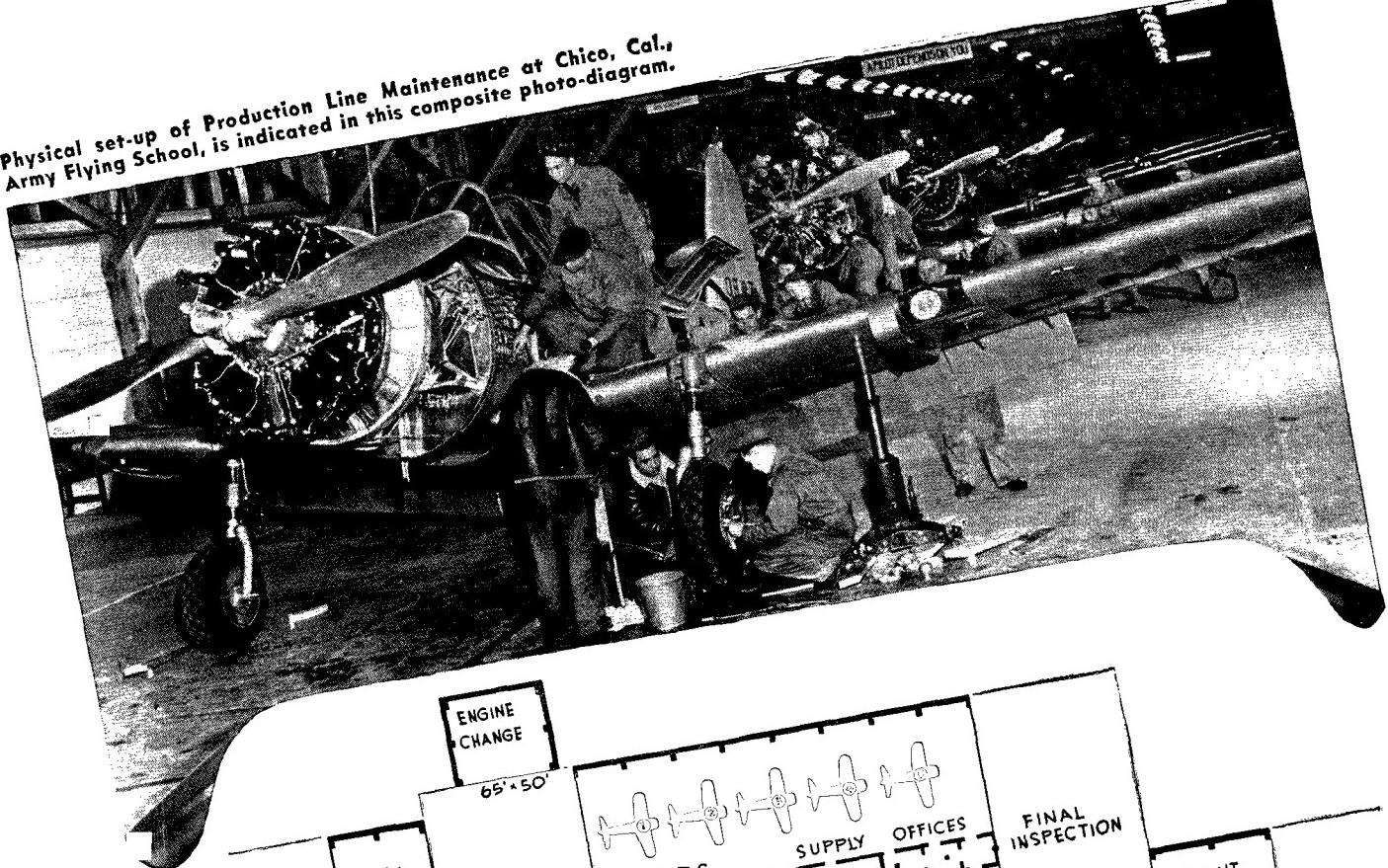
The job was accomplished in three days. The Britisher unhesitatingly climbed into his plane and flew it to an air base where full repairs were made. *



It isn't often that a sergeant pins the gold bars of a second lieutenant and the silver wings of an AAF flying officer on a newly graduated aviation cadet, but Second Lieutenant John Adams was proud to have Sergeant Harold M. Adams do the honors when he was commissioned at ceremonies at Luke Field, Arizona, Army Advanced Flying School.

The reason — Sergeant Adams is Lieutenant Adams' father, and a mech ON THE LINE in that same squadron where the Lieutenant was trained.

Physical set-up of Production Line Maintenance at Chico, Cal., Army Flying School, is indicated in this composite photo-diagram.



PRODUCTION LINE MAINTENANCE

By Lieut. Colonel Charles E. Cox

AAFWCTC, SANTA ANA, CALIFORNIA

ONE of the major factors in the air crew training record of the Army Air Forces has been Production Line Maintenance, originated last fall by the AAF West Coast Training Center and now being adapted for use at every basic, advanced and specialized flying school in the Flying Training Command.

PLM makes maximum use of every available technician and, at the same time, educates the new mechanic with the greatest possible speed. Its installation has invariably resulted in reduced man hours per inspection, higher percentage of airplanes in commission and, above all, better maintained equipment.

Production line maintenance is not an innovation; it's an evolution born of necessity. The accompanying administrative chart gives the organization breakdown for accomplishing all 50-hour and 100-hour inspections, utilizing the highest

type specialists procurable at a post. The importance of maintenance is indicated by the contemplated creation of the position of Director of Maintenance, or at least an S-4 Officer who teams up with the Director of Training. Under him come administrative personnel, hangar chief, specialty shop crews, engine change crew, and so on. A station operating 150 airplanes will have a PLM organization approximating 150 men, one-third of whom are apprentice trainees. Trained men are procured by the assignment of detachments from all school squadrons to accomplish the organization total.

Airplanes up for 50-hour or 100-hour inspection are delivered to the uncowl apron by the school squadron. Primary inspection for such apparent faults as oil leaks is made as the uncowl crew removes cowling, inspection plates and batteries, drains oil pump and cleans strainers.

These parts and the airplane then move forward to the rack where the wash crew takes over. Fifteen minutes on the wash rack and the plane moves on to inspection. Cowling goes into a portable dolly which rolls to sheet metal shop for repair. Inspectors fill out worksheets, itemizing operations in addition to normal inspections found and reported by the school squadron. On 100-hour inspections the radio crew removes the set and the equipment goes to the radio shop.

The chart gives the organization breakdown from this point forward. The work stations are each manned by one staff sergeant, one sergeant, one corporal, one private first class and four students.

From four to six stations may be designated for a given job. Completion of work at Station 1 is followed by the manual movement of the airplane to Station 2 and so on to 3, 4 and 5. Each

Streamlining the aircraft maintenance program in the AAF to reduce inspection man hours, speed the education of new mechanics and keep a greater percentage of planes in the air.

station records the time required to complete each operation. Specialty shops and engine change have crews comparable to the respective stations, although a variable is encountered here in that propellers and welding (brackets, minor work, etc.) do not require the same number of specialists as radio and sheet metal. Students are also assigned to the specialty shops. Most of them are recruits having had civil experience in such work. At the last station, the airplane receives the final check, followed by base technical inspection. Pre-flight check and return to flying status follow.

Some advanced flying schools use a three-shift operation. Basic schools accomplish night maintenance with a combination double and staggered shift. Airplanes are received for inspection at 1730 o'clock. The first shift, all but station work crews, is on from 1700 until 0030 o'clock, and the second shift from 0015 until 0800 o'clock, or completion of work. This permits an overlap at midnight and a welcome hot meal.

Work-station crews report successively at 1800, 1900, 2000 o'clock and so on, and remain until their work is accomplished. Since planes are not available until the end of the day's flying and since they require time to wash and move through the line, the reason for staggering of hours is obvious. One swing shift per line, capable of accomplishing any work, is always available to permit one 2½-hour pass per week for each man. If final inspection should determine that the wheel and brake crew, released from duty prior to the final inspection, has failed in any particular, this crew is returned to the hangar to accomplish the correction. No stoppage of the production line is permitted by the need for sub-depot work or lack of parts. No specialty shop tasks are undertaken that slow the line.

Supply becomes the master issuing agency and reduces squadron technical supply to a bare minimum. Supply personnel are on duty 24 hours a day to stock up during the day and to issue at night when PLM is in active operation.

Students and one experienced man move from station to station weekly and are graded by the station leader. These grades accompany the trainees upon his return to his squadron. During inclement weather, additional training is given by assigning trainees to read technical orders under the guidance of an experienced

man. The operation demands complete cooperation among school squadrons, sub-depot and the PLM organization. Sub-depot commanders recognize that the system will relieve them of small odd jobs, permitting full effort on T.O. compliance, accident repair and depot inspection repairs. Personnel on PLM must be relieved from special duty during work hours.

There must be cooperation on promotions. Weekly meetings between squadron officers and PLM officers are held to review engineering standards and division of work.

Importance of school squadrons is not reduced by installation of this system. They concentrate on daily and 25-hour inspections, clean canopies and cockpits, and do all the miscellaneous tasks that make up efficient service to the pilot. Furthermore, as students and trained personnel are all rotated through PLM, the activity becomes a community effort. The squadrons all participate, all profit.

Prior to PLM, airplanes at times were grounded for lack of parts when the needed item was actually in the supply section of another squadron. Under a Director of Maintenance, the cause for grounding any plane is investigated immediately. Fat and lean extremes, such as one squadron with a Kerrick cleaner and five others with none, is remedied by assignment of the cleaner to PLM, where all airplanes are washed every fifty hours. The station breakdown of work is continually subject to improvement. Men with some statistical training, whether or not they have had aeronautical background, study parts exchange, movement of men and equipment, and utilization of critical tools by all shifts on the relay race principle. Their recommendations are saving plenty of time and paper work.

With reference to the physical set-up chart, the 130 by 160-foot building is a departure from the standard hangar in that it is specifically designed to maintain airplanes, and not just to house them. Supply, shops, power, light and air lines are centrally located to reduce movement. Work benches are placed along the center aisle. Lights on counterbalances are designed to fit the needs of individual work stations.

The Corps of Engineers has estimated cost of the building along at \$42,000, compared to \$62,000 for the smallest standard hangar, the 80-by-120-foot OBH 2. The building "fits" a unit of 150 airplanes as standard equipment, in much the same way as a tool kit and motor cover go with one plane.

Each post PLM is a production line of students. Training of maintenance and engineering personnel and the accomplishing of inspections can function on the same primary-basic-advanced basis and with the same centralized supervision as pilot training.

Excerpts taken at random from stations' reports on production maintenance best summarize the record to date:

"Trains better mechanics in a shorter time."

"Greatly reduces inspection and engine change man hours."

"Prolongs airplane life and increases time between overhauls."

"Releases more airplanes to flying department, permitting the station to operate with fewer ships."

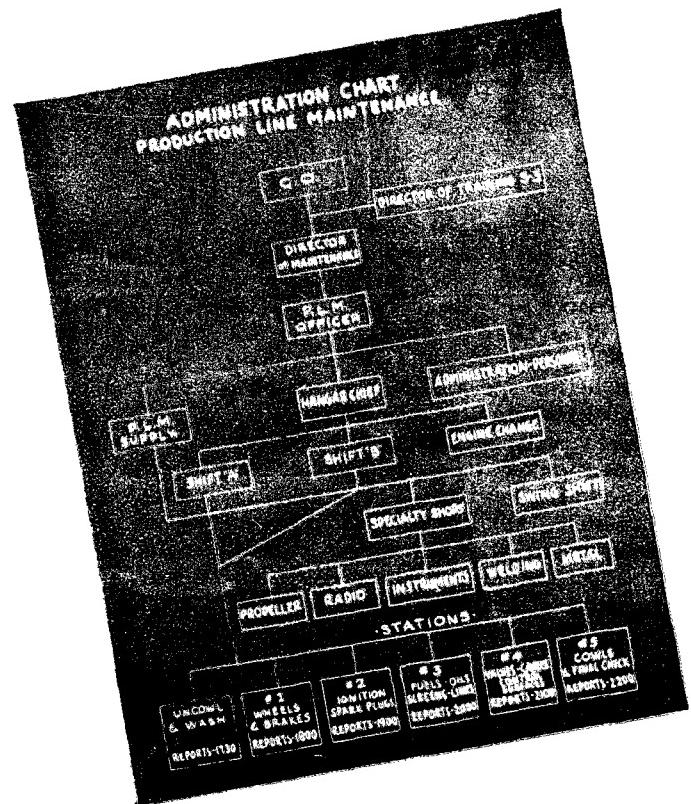
"Reduces number of airplanes grounded during day because of small defects."

"Anticipates parts needed in advance."

"Gives planes better appearance."

"Maintains airplanes better."

As one Director of Training put it, "It's a swell feeling to know that all our airplanes are being inspected by the best men we've got." *





CARGO FROM THE SKY

By Theodore A. Berchtold

WRIGHT FIELD

CARGO parachutes, varying in diameter from doll-like two and one-half-foot chutes for dropping messages to giant 48-foot nylon or rayon chutes capable of dropping 3,000-pound loads, provide part of the Army's answer to the problem of supplying ground troops with equipment and materiel.

Developed in the Equipment Laboratory at Wright Field, cargo parachutes are being used by the Army Air Forces in increasing proportions in areas where dropping supplies from the skies is the quickest and most practical method of licking the supply problem.

Although the Army's parachutes vary

in size, the 24-foot chute has become the most widely known because of its all-round usefulness. This parachute can drop loads up to 300 pounds and may be used for both cargo and personnel. Formerly made of cotton, this chute is now manufactured chiefly of rayon with a resultant increase in strength.

The 48-foot chutes, the Army's largest, are utilized for dropping such equipment as the heavy iron matting used for building emergency runways, land-mines, demolition equipment, mortars and other heavy war materiel. These chutes are released by the Army's heavy bombers.

A 12-foot parachute for dropping sea-rescue kits is one of the latest types developed by the Army. This chute is used to drop supplies to crash survivors at sea until such time as planes can be dispatched to rescue the men.

To enable ground troops to identify the parachutes when they land, variously colored canopies are used, each color representing a certain kind of cargo or equipment item. A parachute with a red canopy, for example, might indicate that a machine gun will be found inside the delivery container; a green chute might identify its load as a piece of demolition equipment, and so on. Just to keep the

Parachutes for everything from a bottle of medicine to steel runway matting are providing a big answer to the supply problem in this war

enemy guessing in case it discovers what the color combinations mean, the combinations are changed from time to time.

Although cargo parachutes have only recently been brought to wide public attention, their origin is not a development of the current war. They were first used by the French in 1918 when French flyers dropped supplies to troops along the Belgian border. Since this development occurred during the closing days of World War I, little more was done in the development until the present war when military experts again saw the possibilities of using parachutes for cargo purposes.

To the parachute research experts at Wright Field, cargo chutes, from a technical point of view, are no different than chutes used for dropping personnel. Basically, whether the parachute has attached a human being or a freight cargo is of little difference for the problem is simply one of dropping a "dead load." Obviously, safety factors are vastly more important in the one type of chute than in the other, but the theory lying behind parachutes of definite sizes to carry definite weight loads remains the same.

Aerial delivery containers, in which the dropped supplies and equipment are packed, have been standardized as the results of experiments conducted at Wright Field. There are now two general types of

container. The first is a cardboard box, with fabric covering, which can be used to drop anything from bulky metal objects to delicate instruments. It is an all-purpose container. The second type is a cotton blanket roll, eighteen inches in diameter and five feet in length. Packed in this roll are such items as guns, mortars, ammunition and other materiel.

The smallest chutes—those two and one-half feet in diameter—are of great value in dropping sustenance kits, messages and other small items not exceeding one pound in weight.

So that ground forces may quickly identify parachutes dropped during night operations, special lamp assemblies resembling flashlights are attached to the aerial containers. These lamps, which have bulbs at both ends, are fitted with colored plastic caps so that the nature of cargo released can be identified easily by means of the colored lights.

Cargo parachutes have been used largely in low altitude operations to permit accuracy in dropping the supplies. A cargo chute can be released from 100 to 150 feet above the ground since it will inflate in one and a half seconds.

Research experts are now tackling the problem of high altitude dropping, but so far no satisfactory timing device has been

developed to assure the loads reaching their ground destinations with accuracy. There is a vast difference in releasing a bomb at high altitude and sending a cargo parachute earthward from a similar height. To find a satisfactory solution, parachute workers are now experimenting with a number of automatic timers and they believe that in the near future chutes may be released from high altitudes with almost the accuracy of bombs.

"We're getting ideas every day from all over the country on parachute improvements," declares J. J. Maskey, chief of the parachute unit of the Equipment Laboratory at Wright Field. "The idea of using paper for parachutes is particularly popular. We have been working with paper chutes for ten years, but none of them developed to date are entirely satisfactory, due chiefly to the fact that paper has a habit of splintering."

Pneumatic parachutes are also widespread in the minds of the country's amateur scientists, largely because they involve the possibility of controlling the rate of descent. As a parachute, however, a balloon is impractical, for its bulk is excessive, to say nothing of the complications involved in the design of a suitable inflation system.

As to the ultimate weight loads that will be released by means of cargo parachutes, the answer lies in the question of how much weight the planes can carry. Parachutes can drop anything that a plane can carry and unload in flight. It will be up to the aeronautical experts of the future to provide the final answer. ☆

The A-4 delivery container consists of two general purpose cases with cargo parachute on top.



This is the type of container used to drop ammunition by means of the cargo parachute.



Fashions

FOR AIR WAR

By

Private

D. J. INGELS

WRIGHT
FIELD



SEVERAL weeks ago a little group of huddled figures sat in a cold, tank-like chamber at Wright Field, analyzing a galaxy of quivering dials and instruments between short gasps of oxygen. Grotesque-looking behind their goggles, oxygen masks and helmets, they were testing the Army's latest electrically-heated clothing for combat pilots, who fight in the great new battlefield eight miles above the earth where frost-bite is as dangerous as an enemy bullet.

Inside the chamber the temperature dropped to sixty degrees below zero, as cold as the coldest Arctic freezes. The men moved about, changed chairs, scribbled brief notes on little paper pads and talked with each other as though they were in a warm parlor. They played poker, dealing from the deck with gloved hands warmed by a maze of tiny wires. They ate from a tray of sandwiches with quick, choppy bites not daring to expose their lips. They drank hot cups of coffee because water froze in their cups before they could pour it.

For eight long hours they sat inside this huge ice box, which you might compare with the one in your kitchen except that it can be made five times as cold. This was the longest test of its kind on record and the new equipment proved so effective that engineers and designers now are developing the garments in quantity.

Today there are four general types of flying suits being adopted for our airmen: the electrically-heated light-weight flying suit, the multiple type suit consisting of several layers of garments piled one upon another, shearling or Alpaca lined two-piece suits, and feather-lined, quilted flo-

tation suits. These are the best latest types and already they are proving satisfactory under flying conditions.

Each of these garments is the outgrowth of a particular problem. When machine guns began to bristle from our big bombers, it was learned that a man of normal size clothed in a heavy, bulky flying suit couldn't climb into the new ball turrets. On long flights pilots and co-pilots who had to sit in one position for long hours complained they suffered from the extreme cold. More recently, the men who fly our planes in African skies have found themselves in a peculiar position. On the ground, temperatures are reasonably moderate, yet when they climb rapidly into the sky thermometers drop sharply to sub-zero. To remedy these demanding situations something had to be done quickly. Engineers turned to the electric suit.

IN general terms the electrically-heated flying suit is a regulation pilot's combat uniform of light weight material. A series of little flexible wires inside its lining supply it with artificial heat. The principle is the same as that employed in the heated blanket which you use on cold nights. Instead of connecting into a wall socket, the pilot plugs into a circuit that gets its current from the main generator unit on a bomber or fighter. Wires are connected with a rheostat which regulates the heat as desired according to the varying altitudes.

The suit is three-piece with jacket, trousers and coveralls. The latter slips over the other clothes. Also included are electrically-heated leather gloves and light-

weight felt shoes worn with a pair of wool socks. Pilots say the shoes are the most comfortable they have ever worn.

Under actual tests, such as that conducted in the cold room at Wright Field, these new suits have proven they are serviceable in temperatures as low as sixty degrees below zero. Earlier types using the same principle are worn by our pilots even now in the combat zones. But the new types are now being manufactured in considerable numbers and soon will be available. The chief advantage of the electric suit is that it retains warmth longer than the other types.

THIS solved only one problem. There were many others. Our hemisphere defense plans, long before December 7, 1941, included outlying bases which stretched from ice-capped Greenland to the warm waters of the Caribbean. Where it is coldest and the wind howls the loudest, American flyers and their ground crews have made their new homes. For more than two and a half years they have lived in the sub-zero world where the nights are six months long and almost daily the snow whips up a blizzard like the one you see once a year along Michigan Avenue in Chicago.

"We need a combination-type suit," wrote one pilot from an advanced Arctic base. "Give us something that we can wear on the ground in temperatures around zero and, at the same time, make it an outfit that we can put on with considerable comfort up in the air when it gets minus fifty degrees Fahrenheit."

Air Forces "tailors" were momentarily stumped until they hit upon a simple idea that is proving to be just what was needed—two complete uniforms, one to fit over the other when the mercury begins to drop. Around this common-sense principle, much the same as that which tells you to wear your overcoat on a cold day, the Army has created its present day combination suits for our airmen. Actually the new uniform is two layers of clothing each of which can be worn separately as a full uniform.

Under actual cold conditions, experiments have revealed that this type of uniform is warmer than the heavy wool-lined suits which are almost universally standard today. Experts point to the fact that the "dead air" between layers of clothing acts as an efficient insulator in helping to keep them warm. If you need proof try out the old axiom that several light blankets are warmer than one heavy quilt.

This multiple suit, as it is called, consists of an Alpaca fur-lined jacket, with an outer material of smooth, satin finish, which has been acclaimed for its wind resistance. (The Alpaca is a small South American animal, whose fur is being shipped to this country in large quantities under Lend-Lease.) Some jackets are lined with shearling wool or piling.



Combination multi-layer suit with two uniforms and vest fitting on top of one another.

Trousers are also lined with the same material. Both jacket and trousers have large pockets, a feature deemed essential after long study. The reasoning is based on the fact that airmen are constantly complaining they have no place to put small articles which they are required to carry with them to and from their planes.

Wearing only this inner uniform, the pilot can be comfortable in temperatures that range from thirty above to zero. It weighs only about eight or nine pounds and can be worn almost anywhere—in club room or at the base theater. However, when the temperatures run to extreme lows, another uniform is donned over this base suit.

The outer garment, consisting of jacket and trousers, leaves plenty of room for the "dead air" to circulate between the layers of clothes. Made of rough tackle cloth that is wind resistant the jacket has a large Alpaca fur collar which can be converted into a parka-type hood. Trousers held up by large suspenders serve as coveralls and are worn over the base uniform. An Alpaca fur-lined vest is also worn between the base garment and the tacklecloth outer gear where temperatures drop to extreme cold.

PRESCRIBED with the multiple type suit are rubber-soled canvas boots with a design similar to the Mukluk, which for years has been worn by the Eskimo. Experts have learned it is the warmest footwear to be worn in the Arctic. Now it is proving to be the most efficient for retaining warmth at high altitudes.

New improvements have also been made in the sheep shearling suit, worn today by most of our Air Forces personnel in the continental United States where temperatures seldom drop to extreme sub-zero levels. Briefly, the new shearling suit, consisting of jacket and trousers, is lighter and more flexible than those formerly in use. In addition, the process once used in treating the skin

chemically to give it longer wear has been eliminated because it had a tendency to crack the leather and make the suits stiff.

The new shearling-lined suits will withstand temperatures down to forty or fifty degrees below zero. Their principal shortcoming is that they do not retain the heat as long as the multiple-type or electrically-heated suits. Then, too, they are rather bulky, but engineers are developing new designs to remedy this.

Latest development in new suits for our aviators is the down and "chicken feather" flotation suit. Although the down feather suits have been in use for years in Alaska, only recently have engineers turned to the chicken-feather suit now in production. Chicken feathers were found to add buoyancy to the down suit and, at the same time, preserve the warmth characteristics which had made



Network of wiring shown in lining of the suit. Note the electrically heated gloves.

it so well suited for the Arctic regions. The new model has proved especially effective for pilots who are forced to make long over-water flights.

At Wright Field one day, Captain J. R. Schenck of the Equipment Laboratory donned one of the suits and remained in water for several hours without sinking. Finally, he was pushed under but the floating qualities of the suit brought him back to the surface immediately.

The flotation suit is a two-piece garment—trousers and jacket—with a parka-type hood. The outer material is a heavy, wind-breaker, waterproofed cloth. The jacket and trousers resemble a piece of quilting, lined with chicken feathers and with a cover over it. The new types eliminate the bulky appearance of the original suits and give them flexibility.

Designing auxiliary equipment, such as helmets, gloves and boots, has always been a major problem and new developments are continuously in the works. The latest pilot's helmet is a leather, chamois-lined headgear which has built into it earphones, clamps for holding the oxygen mask and a microphone. It is designed to fit with any mask including

those used by the British, Russians and Canadians. Experiments also are being made on fur caps which may be worn by flyers in the Arctic regions. These new designs are based on the old coonskin caps worn by Daniel Boone and other famous American backwoodsmen. The few which have been ordered are now being worn by pilots in combat zones under severe flying conditions. Reports indicate they may be adopted as part of a pilot's cold weather equipment. Other experiments are being conducted on a large bullet-proof combat helmet, a metal headpiece which looks like the ordinary football helmet.

GLoves, too, have been a constant problem. Already in use are the electrically-heated gloves, the lamb-lined, one-fingered mittens of horsehide with fur lining, and the layer-type combination gloves designed on the same principle as the multiple suit.

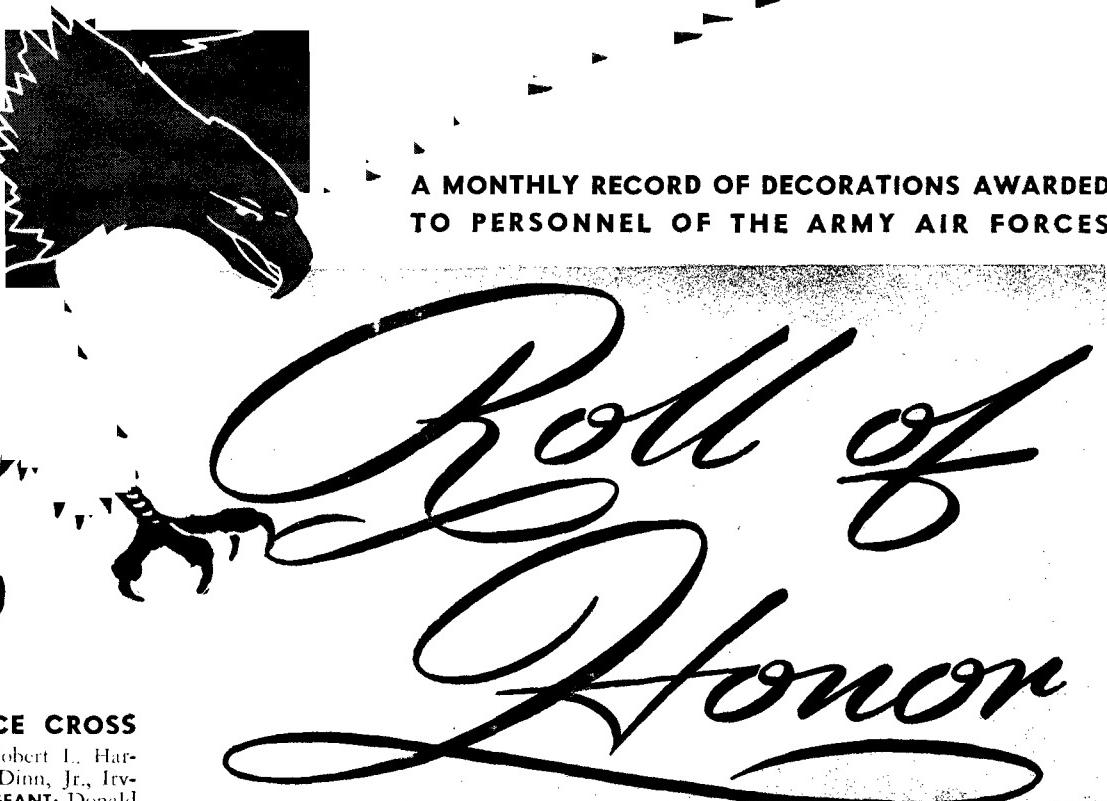
The combination glove is the answer to frequent complaints received from mechs working in the Arctic who have been leaving pieces of skin on metal aircraft parts when they attempted to pull their fingers loose. This rayon glove, light and skin-fitting, has greatly increased the efficiency of the mechanics. Two pairs are worn for warmth.

These developments at the Equipment Laboratory at Wright Field have produced many innovations in commercial clothing as well—new type belts, zippers, parkas, scarfs, leggings, shoes and other every-day accessories which have added greatly to the working efficiency of commercial products. Many technicians in Wright laboratories hold patents on products purchased daily in the department stores of the country.

Such is the story of the Army Air Forces effort to combat the cold of the high-altitudes. It is a never ending story for tests go on night and day, hour after hour. But of more importance is the fact that these advances in clothing for the airman are helping in no small way to win the war in the skies. ☆



The canvas Mukluk and the five-pair "Arctic sock assembly" worn under boot.



A MONTHLY RECORD OF DECORATIONS AWARDED
TO PERSONNEL OF THE ARMY AIR FORCES

DISTINGUISHED SERVICE CROSS

CAPTAINS: Arthur E. Andres, Robert L. Harriger. **LIEUTENANTS:** Wallace L. Dinn, Jr., Irving A. Erickson. **TECHNICAL SERGEANT:** Donald L. Snyder.

SILVER STAR

BRIGADIER GENERAL: James Pratt Hodges. **COLONEL:** Curtis L. May. **MAJORS:** Levi R. Chase, Jr., Donald P. Hall, John B. Holst. **CAPTAINS:** Wilbur B. Beezley, John W. Chiles, Charles H. Giddings (With Oak Leaf Cluster), Coleman Hinton*, Gore Huggins, Philip J. Kuhl, James C. Latham. **LIEUTENANTS:** Richard P. Brannon (Also Distinguished Flying Cross and Air Medal), Arthur L. Burger, Thomas P. Carter (With Oak Leaf Cluster and Air Medal with three Oak Leaf Clusters), Garth B. Cottam, Joseph F. Dockweiler, Jr., Robert W. Elliott, Robert L. Faurot, John H. Geer, Wilson B. Glover, Robert W. Helms, John E. Heschelbarth, Gilmer H. Holton*, Sidney W. Jacobson, John B. Johnson, Melvin B. Kimball, William R. Lett, Leon G. Lewis, John W. Lyle, Jr. **MASTER SERGEANT:** Elmer H. Johnson. **TECHNICAL SERGEANT:** Michael J. Bauman, Jr., B. Hancock (Also Distinguished Flying Cross and Air Medal). **STAFF SERGEANTS:** Donald S. Allen, Theodore J. Bokoles, John Breen, Glen F. Bruns (Also Purple Heart), Joseph J. Byrne, Richard K. Ferrill, Norman S. Goldstein, Raymond F. Jesck, Morris O. Kolling (Also Air Medal). **SERGEANTS:** Edward D. Connor, Jr., Fritto E. Del Vecchio, Edward W. Driscoll, Bernard V. Duclos, Joseph E. Hartman, George F. Keloe. **CORPORALS:** Hubert W. Crowell*, George W. Dustin, Jack W. Fox*. **PRIVATE:** Adam E. Gross.

OAK LEAF CLUSTER TO SILVER STAR

COLONEL: Robert L. Scott, Jr. **MASTER SERGEANT:** Pete M. Vasadic. **STAFF SERGEANT:** Virgil E. De Voss.

PURPLE HEART

LIEUTENANT COLONELS: Levi C. Erdman, Jo K. Warner. **MAJORS:** Jack S. Marks (Also Air Medal), Bernard A. Schriever. **CAPTAINS:** Charles W. Denning*, William B. Kyes, Robert D. Spitzer (With Oak Leaf Cluster and

two Oak Leaf Clusters to Air Medal), Thomas B. Storey. **LIEUTENANTS:** Charles E. Bergdolt, Robert B. Bowcock, Nathan H. Corman, Nelson P. Davis, David N. Hirsch, Walter Holmes, Jr., Robert F. McMahon, Harold E. Mitts, Scott H. Neal, Carl T. Rauch, Robert M. Richey*, Meech Tahsequah, Spencer Treharne. **MASTER SERGEANT:** James R. Walter. **FIRST SERGEANTS:** James W. Carr, Herbert B. Martin*, Wallace R. Martin*. **TECHNICAL SERGEANTS:** Monroe M. Clark, Raymond E. Powell*, Charles C. Schierholz. **STAFF SERGEANTS:** Ralph Alois*, Billy O. Brandt*, John E. Cane, Edward H. Caton, Charles N. Doty, Herbert E. Fisher, George K. Gannam*, Carl R. Gross, Henry J. Humphrey*, Dennis W. Lawrence, John H. Mann*, Allen Middleton, Colton E. Neely (Also Air Medal), Herbert Newell, Jr., Louis F. Patriquin, Curtis Q. Pyrah, Warner E. Renner. **SERGEANTS:** Delmas F. Bise, William C. Boggs, Vincent H. Bonilla, Bill V. Dichtl, William W. Dunnivant, James B. Ellick, Fred M. Goyan, Sidney V. Hall, Ned R. Herzstam (Also Air Medal), Jealld H. Jones, James A. MacCannond, Jr., Paul V. Moreno, Jacob T. Suba. **TECHNICIAN FOURTH GRADE:** Joseph A. Vanic. **CORPORALS:** Weldon C. Burlison*, Richard X. Chabalowski, Harold F. Graf, John J. Kohl*, Hubert D. Smith (Also Air Medal), William C. Westbrook. **PRIVATES FIRST CLASS:** Earl D. Ashley, John E. Cruthirds*, James J. McClintock*, Robert H. Mayer, Horace A. Messam*, Joseph E. Nelles*, Leroy J. Turnes. **PRIVATES:** Jerry M. Angelich*, Robert G. Brown (Also Air Medal), Joseph H. Guttman*, Edward R. Hughes, Lawrence P. Lyons*, Joseph G. Moser, William M. Northway*, Maurice J. St. Germain*, Marvin V. Wingrove.

DISTINGUISHED FLYING CROSS

COLONEL: George J. Eppright. **LIEUTENANT COLONEL:** Austin A. Straubel*. **MAJORS:** Philip T. Durfee, Leland G. Fiegel. **CAPTAINS:** Bennie

Lombard (Also Air Medal), Albert Nowak, Ramsay D. Potts, Jr., Henry S. Taylor, Harold R. Warren, Jr. (Also Air Medal with three Oak Leaf Clusters). **LIEUTENANTS:** Bruce B. S. Barker, Vance L. Beebout, Francis R. Cappelletti (With Oak Leaf Cluster), Phillip E. Cartwright, Leroy E. Ellis, Allen W. Gardener, Jr., Ritchie B. Gooch (With Oak Leaf Cluster), Preston Holden, Norman L. McDonald, Blesch Malmstone, Russell J. Maure, Charles E. Norton, William A. Peterson, William M. Railing, Paul R. Ridley, Robert L. Rose, George A. Schnieders, Verner L. Shea, Bryce V. Smith, George W. Wamsley, Jr., Ralph K. Watts, Robert R. Wilson. **MASTER SERGEANT:** Anthony A. Kuzdrall. **TECHNICAL SERGEANTS:** Glen Beard, Donald T. Ostlund (Also Oak Leaf Cluster to Air Medal), Frank Sayko, Jack R. Tribble. **STAFF SERGEANTS:** Ira A. Adams, Harold R. Conner, George H. Crawford, Irwin W. Dial, William L. Hotard, Cortez E. Houston, Victor Lorber (With Oak Leaf Cluster), Frank W. Lytle*, Claude W. Patterson, Leo Wheatley, Francis W. Wolf, John Wycheck, George E. Zorbach. **SERGEANTS:** Wilbert H. Rogan*, Wallace J. Hewston, Russell J. Huffman, Raymond R. Joslin, Michael L. Kenny (Also Air Medal with two Oak Leaf Clusters), Irving W. McMichael, Guy E. Reynolds, Jr., Thomas J. Stewart, Allen B. Whitehead*. **CORPORALS:** Robert F. Borchert, William B. Bradley, Paul P. La Valle, Benjamin C. Navage, John Thompson, Jr. **PRIVATE FIRST CLASS:** Edward A. Carroll.

SOLDIER'S MEDAL

CAPTAIN: Gerald J. Crosson. **LIEUTENANT:** James H. Horn. **STAFF SERGEANTS:** Charles W. Michaelis, Louis Rabesa, Jr. **SERGEANTS:** Joseph J. Lapent, Frank P. Pierog, Edward T. Taylor. **CORPORAL:** Ernest E. Haack. **TECHNICIAN FIFTH GRADE:** Bruce Stone. **PRIVATES FIRST CLASS:** Jesse E. Sailors, Harry S. Wheeler.

AIR FORCE, August, 1943

AIR MEDAL

BRIGADIER GENERAL: Russell E. Randall.
COLONELS: Charles M. McCorkle, Phineas K. Morrill, Jr. **LIEUTENANT COLONEL:** Hiette Williams. **MAJORS:** John C. Bowen, Robert E. Coulter, Ryder W. Finn, Maurice J. Fitzgerald (With Oak Leaf Cluster), Charles A. Gayle, Robert B. Keck, Harmon J. Lampley, Francis H. Matthews, Gordon E. Menzies, Edwin B. Miller, Jr., John A. Rouse, Harold J. Skelly*, Robert E. Smith. **CAPTAINS:** Charles E. Hansen, Claude W. Allen, Ralph A. Blakelock, Robert W. Bonhard, Richard H. Cole, William C. Collins, Ralph F. Dawson, John W. Fletcher, Raymond A. Fortin, Charles William Gettler, L. R. Moore, G. W. Rogers, Frank G. Ward. **LIEUTENANTS:** John Arthur Ahlm, John Joseph Alder, Fredric G. Altman, Frank R. Amend, Arthur C. Anderson, Edward L. Anderson, John Thomas Ashford, Jr., Richard Foster Atchison, Jr., Robert F. Ballash, John R. Bannon, Jack C. Baur, Frank R. Beadle, John T. Bent (With Oak Leaf Cluster), J. L. Pitts, Jr., Billy W. Wheeler, Dave W. Williams, Paul Williams, Albert J. Wilsey, Jr., Joseph M. Wunderl, William P. Wyllie, Jr. (With Oak Leaf Cluster), William F. Xavier, Alexander Yonich (With two Oak Leaf Clusters), Walter Zoppi (With two Oak Leaf Clusters). **MASTER SERGEANTS:** Wilson P. Currie, Lloyd D. Killam, Chester Milia. **TECHNICAL SERGEANTS:** Roy J. Anesi, James R. Currie, William J. Devine, William L. Engler, Clifford Harry Fleming, Erwin K. Freytag, Lester O. Gardner, Frederick A. Hartung, Jr., Francis G. Hinds (With Oak Leaf Cluster), Glenn E. Lathom, Wilbert A. McClellan, Alvy G. Masters, Merle L. Oakley, Allen W. Ram-

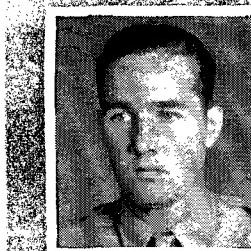
sey, Leon L. Ranforth, Norman C. Threewitt, Delbert Villanueva. **STAFF SERGEANTS:** Joseph R. Alvey, Carl J. Anderson, Carl L. Appling, Kenneth T. Bagnell, Gordon N. Bennett (With Oak Leaf Cluster), Fred J. Bewak, Joseph W. Bunn, Arthur H. Burrow, Richard C. Carignan, James J. Carpenter, Frederick E. Davenport, Jr., Edward F. Drake, Henry R. Eaton, Harvell H. Ellzey, James L. Elrod, Stanley F. Fortuna, Douglas H. Smith, Arthur P. Symons, Stanley F. Szczepanski, Robert J. Verlanic (With Oak Leaf Cluster), Charles H. Wall, Robert H. Westrom, Earl T. Wright, Layton E. Yarbrough, Frank J. Zahorsky. **SERGEANTS:** Elmer O. Almy, Roland V. Anderson, Robert W. Anthony, Dewey D. Barnes (With Oak Leaf Cluster), Norman L. Biehn, Richard A. Bieniek, Mac S. Groesbeck, R. R. Gwaltney, Theodore Haas, Martin J. Hill, Lawrence B. Hillard, William D. Hise, Aloysius B. Horstmann, William E. Howard, John D. Hyman, Robert J. Jackman, Andrew L. Jackson, John Jacobs, Jerome James, Howard K. Jaycox, Bernard Jurosek, John E. Kakaruda, Donald W. Kemble, Elmer W. H. Kersten, Thomas M. Klimazepski, William L. Kline, Jr., Charles Thomas Krest, Jason C. Lancaster, Joseph W. E. Lapham, John W. Leuning, Chester C. Love (With Oak Leaf Cluster), William T. Lynch (With Oak Leaf Cluster), Stanley L. McCorkle, William A. McKinley, Ralph B. McMillen, Cecil J. McNeer, Allen A. McRae, David N. McWilliams, Alton F. Mahan, Samuel Mazzo, Vincent C. Mullane, William J. Murphy, George W. Oakes, John M. O'Rourke, James E. Ottot, James R. Parkinson, Frank J. Pawlick, Gildo J. Ponti, Pasquale Prata, Joseph E. Prokop, Walter C. Race, Milton Rayberg, James W. Roberts, Duane W. Rumph, Robert H. Sangster,

Jr. (With Oak Leaf Cluster), Samuel J. Scott, John H. Shearer, Francis J. Simone, Parley D. Small, Harold Snyder, Elwood E. Speelman, Bill M. Stolzer, Norman L. Stubbe, Edward W. Swedo, Harry M. Teufel, Howard R. Thompson, John A. Thompson, John G. Tittsworth, Pierce B. Tyler, Dick Tyron, Aloysius S. Underwood, John F. Vlad, Lee O. Walker, Frank M. Wall, Kent R. West (With two Oak Leaf Clusters), Edward J. White, Thurman L. Wolfe, LeRoy W. Wright, Frank G. Zern. **CORPORALS:** Oliver D. Clements, Ralph M. Colflesh, Edwin W. Connally, Truman B. Corley, West M. Coss, Herbert E. Cummins, Harold Denson, Charles E. Franklin, Donald A. Fromme, Wesley V. Golcher, Gerald I. Grubb, Henry S. Herr, William H. Hickey, Saboian V. Hudson, James R. Lassiter, Weldon R. McWhorter, Orville C. Macklin, James A. Ritz, Michael J. Whalen, Robert W. Wightman. **PRIVATE FIRST CLASS:** William R. Colson, James Geanious, Cling L. Hulcher, Wilbur A. Lewis, Franklin A. McKnight, Delmar R. Ogle. **PRIVATE:** George T. Brouillet, Jesse C. Easterling, David J. Eckholt, Henry Hughes, Benjamin Kleinburg, Bernard D. Lane, William R. McCormick.

OAK LEAF CLUSTER TO AIR MEDAL

MAJOR: Richard D. Stepp. **CAPTAIN:** Kenneth D. Vandenburg. **LIEUTENANTS:** John J. Charters, William B. Drysdale, William K. Long (Three Oak Leaf Clusters). **MASTER SERGEANT:** Edwin F. Rhodes. **STAFF SERGEANTS:** Arlee F. Aten, Lawrence Holgate. **SERGEANTS:** Hugh A. Jones, Jr., Abraham Todras. **PRIVATE:** Wilbert H. Elliott, Vincent O. McMahon, Jr. *

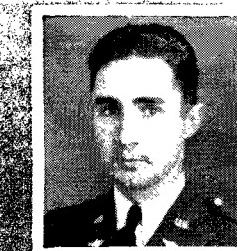
* Posthumous.



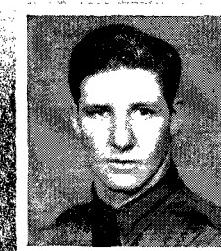
Lt. John A. Adams



Lt. J. C. Pitts, Jr.



Maj. J. S. Marks



Lt. R. L. Faurot



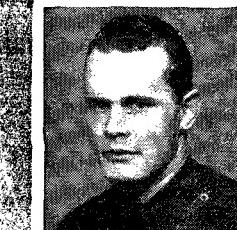
Capt. C. E. Hansen



Lt. S. W. Jacobson



Capt. L. R. Moore



Maj. R. B. Keck



Capt. C. W. Allen



Maj. R. E. Coulter



Capt. G. W. Rogers



Capt. P. J. Kuhl



Lt. S. H. Neal



Capt. W. B. Kyes



T/Sgt. D. T. Ostlund



bursting shells and shrapnel hitting the plane reminded me of a sudden thunder and hail storm heard from the inside of a tin shed. I managed to get the fire out of number four but number three was stubborn and burned more fiercely. I finally feathered it. Number four still was running but it was not much use. The vibration shook the whole ship. The blaze coming out of the trailing edge of the wing grew larger and larger. I knew it was burning around the gas tank and would soon cause an explosion.

About that time all hell popped loose. All our guns were blazing at seven FW-190s that had just attacked right through the flak. Suddenly a hole about two feet square appeared in the wing where number three gas tank is located and flames shot out. It must have been a hit from the bottom because the fire in number three gradually dwindled to the burning of oil. We called for the P-38s to come up and help us but the message probably never went through. Enemy fighters kept hitting us in the rear.

Harry hadn't said a word so I told the crew to put on their chutes and then go back to their guns. Just then one fighter got our instrument panel and windshields with a 20 mm. shell. It exploded right in front of Harry and for a second I thought his face was bleeding as he looked toward me. I knew I was hit too because blood was running into my eyes and oxygen mask. I jerked off my glasses and threw them to the floor. I thought my right eye had been knocked out.

The same shot had shorted the parachute bell so Fozzy bailed out.

Someone called up and said we were afire in the bomb bay, radio compartment and in the waist. I told them to fight the fire but keep an eye on the 190s. Suddenly our aileron controls went limp and the tail dropped abruptly. I knew we had

He was in bed with a bad cold, running a temperature, the day before the raid. But after orders came through that evening he went down to the operations room, checked the course, the navigation, the target, the approach, the aiming point and other problems in planning the mission with his assistants. He had little sleep that night, but he led his Group over Wilhelmshaven the following day.

By now, of course, the impression the men have of their commanding officer is totally different than it was several months ago. Ask any of them what they think of him and the answer invariably is the same—an inadequate attempt to describe their whole-hearted admiration and respect for a man they all say they'd follow to Hell and back, if necessary.

His terseness, at first mistaken for sourness, is now legend.

Once when he was briefing the pilots he told them they would rendezvous with

HELL OVER BIZERTE

(Continued from Page 11)

an elevator knocked off. Harry and I were shoving forward with all our might making for the clouds still below us. Though our guns were going constantly, we were almost helpless. The fighters kept coming in raking the ship from one end to the other. But the flak had stopped. At last the foggy mist of the clouds closed around us and the men were happy.

But instrument flying without instruments is no fun when you have only two engines and a rudder to help you. Somehow we came out below the clouds and were in a valley, limping on and on toward the sun.

FINALLY she quit flying. A mountain was coming up in front, we were losing altitude and we didn't know our speed. Suddenly a little patch of plowed ground came into view. I grabbed for throttles and switches and let her hit. We made it.

We all got out by various means and began looking for wounds. Most everyone had a few scratches and bruises. Harry and I were shot in the legs, arms and face. Vandegriff had a couple of holes in his arms. Everything was pretty hazy for awhile. We dressed our wounds and went to an Arab's house nearby to rest while some of the boys went for help. We didn't have to wait, however. The Arabs took us to a British Station.

Later we were able to chuckle over several incidents.

After Fozzy bailed out, Buck was going to follow, but with his broad beam and seat-pack chute he couldn't quite squeeze through the escape hatch. He tried so desperately, however, that he almost couldn't get back in. I chuckled when Buck came crawling out of the nose with the seat of his breeches torn nearly out.

"IRON ASS"

(Continued from Page 29)

an escort of Allied fighters after attacking the primary target. When someone asked if they would get an escort if they attacked the secondary, he remarked without hesitation, "You won't," and went casually on with the briefing.

One of his officers, who apparently played football before tackling Fortresses, compares him to a football coach.

"He's just like Bierman at Minnesota," the officer explains. "He trains us in fundamentals. Keeps us going in the air, or in school, all the time. He knows his business, and we all know he knows it."

With the Group now taking part on nearly every raid on enemy-occupied Europe, the C.O. is lenient with passes to the combat crews. But when he gives them 48 hours, he doesn't mean 58, as they thought. Anyone who returns too

Tapping me on the shoulder, he shouted, "You've got to land this damn thing because I'm too goddam big to get out."

Incidentally when Fozzy landed in his chute three Arabs came forward. Two wanted to take him to the Germans and one to the English. The one fortunately prevailed after Fozzy had given him his knife as a present. Fozzy learned from the British that he had landed in a "No-Man's valley—the Allies were on one ridge and the Axis on the other.

At one point Whimpy decided things were getting so hot he had better come out of the tail and put on his chute. When he got back one of his guns had been blown off and there was a gaping hole where a seat was supposed to be. Then a FW-190 came in for a tail shot. Whimpy leaned across the opening and sprayed lead from his one gun without aiming. The 190 peeled off hurriedly.

When Gowan was trying to put out the flares which had caught fire, he exhausted his five extinguishers with no apparent results. So he tossed burning flares into the empty ball turret and poured water on them. That did the trick.

When they were ordered to put on their chutes and return to gun positions the whole crew complied except Francis, who was firing so many rounds he figured if he left the gun to get the chute they would get him before he got back. One death looked as good as the other to him so he stayed and kept his turret going even after one gun had been shot away.

Vandy ran out of ammunition so he went to the backdoor and thumbed his nose at the attacking 190s. He figured this was the least he could do.

Out of the seven fighters that attacked us we know that three will never attack again. We got one, maybe two, while Fay in another ship got two.

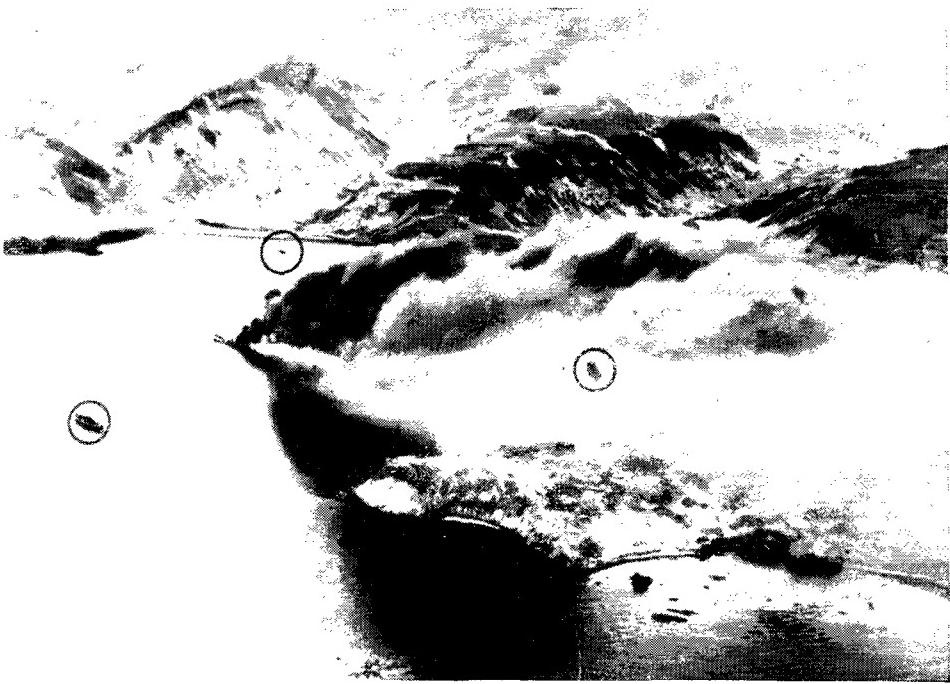
I guess we cheated death. ☆

late, without a good excuse, can be certain of going before a Summary Court, which usually does nothing more drastic than take away some of the offender's pay.

All the men recall their discovery that their C.O. understands men as well as machines. Back in the States, just before the Group departed for England, he gave them a brief lecture on their responsibilities as Americans, as visitors, and warned some of his chronic belligerents against participating in tavern brawls.

"But if you do," he added, "don't get licked."

You probably know other C.O.s like this. You might be serving under one of them right now. The C.O. you just read about is Colonel Curtis E. LeMay, a 36-year-old veteran who, among other achievements, participated in the first "Good Will" flight to South America and pioneered the North Atlantic ferry route. ☆



A Jap transport burns in Kiska harbor and three other Jap ships are marked for destruction by aerial bombardment.

UP WHERE THE SOUP BEGINS

(Continued from Page 15)

Some of the boys had some interesting experiences. Like what happened to Lieutenant David Stevens, co-pilot in a B-24.

He was on the weather run near Kiska. Instructions were to get weather reports and stay away from the big guns defending the main Jap base. The crew had to change ships just before the take-off and the plane they got out in didn't have any bombs. Lieutenant Brown, the pilot, brought the ship to within a half mile of Kiska, and Stevens, thinking he was just a little too close for comfort, sarcastically remarked, "Why the hell don't you fly right over the place?" Brown didn't need any coaxing. He made a 270 degree turn to the right and came directly over South-head, the south point of Kiska harbor. Then he circled right back over Little Kiska at 1,800 feet. The Japs threw up everything but Tojo's false teeth but nothing happened.

During good flying weather the Japs had plenty of practice with those ack-ack guns. When the soup cleared we had to make up for lost time. Often enough it meant pushing those heavy ships along 20 feet over the water. That's almost close enough to get your feet wet. One crew ran into some fog about twenty minutes out and stayed at 20 feet for three and a half hours. They climbed to 4,000 feet to feather a prop 700 miles from their base and then flew back again at 20 feet.

Sometimes the Japs play a pretty smart game with their ack-ack guns. Lieutenant Madison went up to Attu one day and found the weather overcast at 1,200 feet. He observed the island from an offshore point of about two miles and then entered

Holt Bay to inspect enemy activity there. He went directly into the harbor at 660 feet and found no opposition at all. When he turned to leave the bay after deciding that the enemy obviously was not prepared to defend it, all hell broke loose. Ack-ack bursts were all over the place. The Japs had waited patiently until he was within 500 yards before they opened fire. Nobody knows how, but he got his ship back safely.

ON THOSE missions we used to have a lot of fun listening to the Japs on the radio. They talked pretty good English and they tried to scare us away. Most of the time they hissed, "Men of Umnak, you are doomed. Lay down your arms—surrender." Sometimes they would offer misleading remarks, such as "Ret's get home" and "That ship went down." They screamed and bellowed blood curdling yells but we used to hand it right back to them. We found out that they didn't like to be called little men. So we called them little bastards and little sons-of-bitches. Our Colonel, W. O. Earickson—there was a man—holds the Aleutian title for plain and fancy cussing at the Japs. He didn't understand fear and he used to go right over the strongest Jap installations swearing a jagged blue streak and dropping a few bombs just to let them know he wasn't kidding.

In the kind of weather we were flying, the navigator was the boss. Pilotage was extremely difficult even when the visibility was decent. One day you would see a mountain right close by and the next day you wouldn't be able to find it.

Most of the flying was on instruments, but we found out that the only use for a drift meter was to hang our hats on it. All the wind judging up there is done by the visible observation of the white caps—and that can be surprisingly accurate after a little practice. The ocean swell comes in and moves out again from under the white caps, making the caps move into the wind. Accurate wind velocity and direction could be determined rather easily that way.

The Aleutian theatre is probably the only place where you should not fly a tight formation. In that kind of weather, you have to split up or you'll be running into your own ships.

We happened to be flying the big ships, but our fighter squadrons—38s, 39s, and 40s—really did a terrific job. At first the Japs relied upon their float type Zeros, but our fighters polished them off so neatly that the Nips had to depend almost exclusively on ack-ack. But that didn't stop the peashooters. Those 39s used to go in and actually drive the ack-ack guns right out of their mounts—and we don't think they did the Jap gun crews much good either.

The Japs built hangars for their planes but the 38s with bombs on their wings knocked off the hangars as fast as the Japs built them. They also constructed a submarine base and Captain Brickeet must have considered that a personal affront. He came buzzing along with a couple of bombs and bingo!—no sub base. It got so bad for the Nips that they began using beached boats as supply depots. That fooled us for a while until one of the boys got curious. He dropped a few on one of the boats and it burned for six hours.

One day over Adak two P-38s jumped on a big Jap plane. He got smart and ducked into the clouds. So one 38 went above the cloud and one dropped beneath it. They just hung around waiting for the Jap to come out, and two seconds later he joined his honorable ancestors.

Everybody up there did a bang-up job but our mechanics had the toughest deal and the stuff they did is unbelievable. Despite the weather, they worked right out in the open. One time they dismantled a complete B-24 engine looking for a good piston to put on another ship. Try that when the mercury is dropping out of the bottom of the thermometer. Another time, a 38 came in for a landing, ground looped, and cut the tail right off of a 24 from just behind the waist gunner's window. The mechs took a tail off another wrecked 24 and attached it to this ship. The job took a month but that plane got back into the air.

That's how it goes. . . .

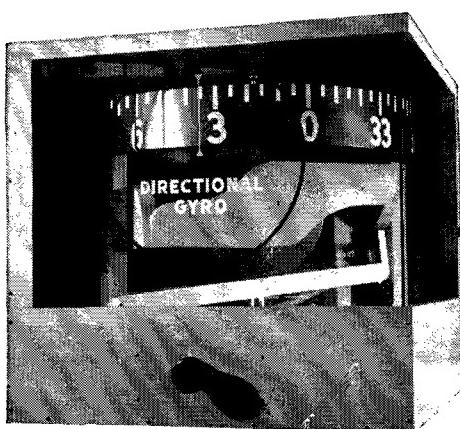
It takes longer and it's harder work, but we get things done up there. And it means more that way. Just the same, if you get the Aleutian assignment spit into the wind once for us. ☆

SYNTHETIC DEVICES

THE number and scope of synthetic devices in use by Army Air Forces training activities are continually increasing. Commercial manufacturers, as well as experimental engineers in Allied military services, are working overtime to develop these gadgets which result in valuable short cuts and in the saving of critical materials and equipment in wartime air training.

The four devices shown on this page

are typical of the many included in the synthetic training devices catalog distributed by the AAF Training Aids Division to the headquarters of Commands and training Air Forces. In addition, AFTAD maintains a display room of these devices at its headquarters, Park Avenue and 32nd Street, New York City. Brief descriptions of selected devices will appear from time to time in the Training Aids section of AIR FORCE.



Directional Gyro Mock-up

WITH the introduction of the giant directional gyro mock-up, one of the most troublesome problems of classroom instruction has been solved. Large groups of students can see the workings of the mechanism without difficulty as the instructor proceeds with his explanation.

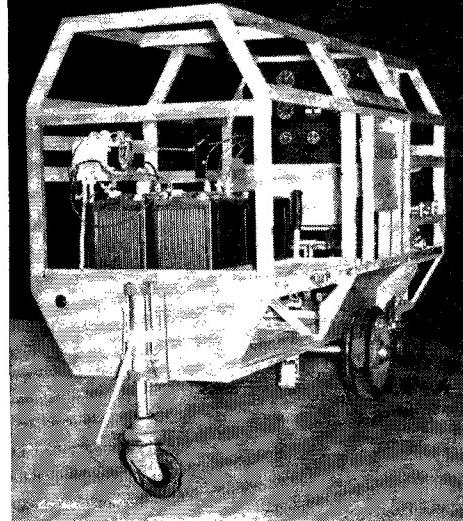
The gyro mock-ups range in size up to 24-inch cubes. Many of them are built in cutaways so the internal mechanism can be shown. They are of commercial manufacture.

Most of the other airplane instruments are being similarly duplicated.

Bendix Navigation Trainer, Type E-1

THE illustration shows the Bendix Navigation Trainer, Type E-1, with the cowling removed.

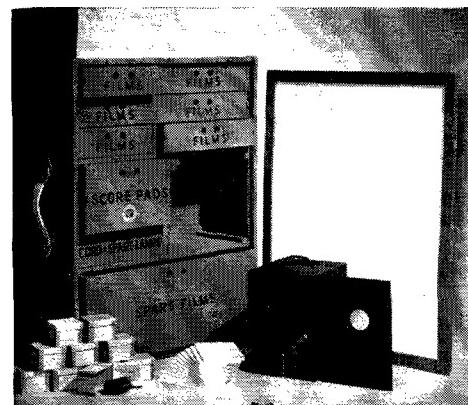
Actually, it is a mock-up cockpit with all necessary instruments, mounted in a cart which moves slowly over the floor. Equipment is provided to permit practice and instruction in dead-reckoning, radio direction-finding and homing. A chalk mark on the floor indicates the path to be taken by the cart.



Fixed Gunnery Deflection Trainer, 3-B-6.

THIS device is composed of a long stand with the target at one end and a reflector sight and spotlight at the other.

The target is a standard airplane model supported in front of a background of clouds. The plane may be adjusted to any altitude and the control operated to indicate any desired speed.



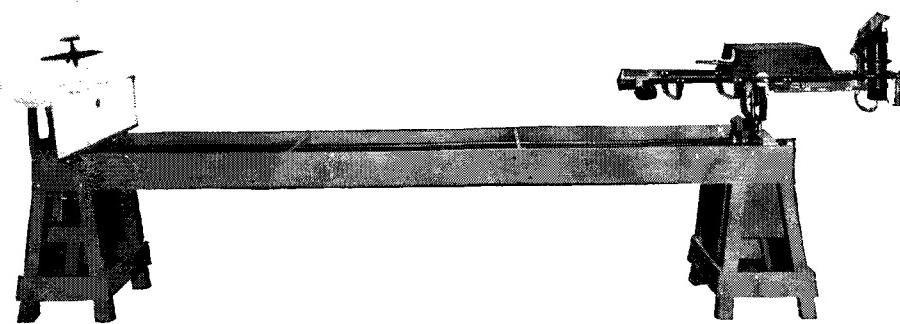
Visual Quizzer

THE spirit of competition is injected into training with the visual quizzer, a gadget which shoots rapid-fire questions on everything from naval vessel identification to celestial navigation.

It is a compact portable unit, complete with projector, screen, scoring pads and films.

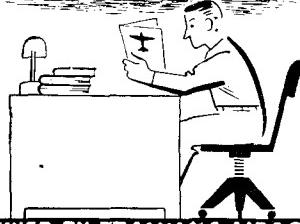
Film frames with illustrations and multiple-choice questions are flashed on the screen at automatically-timed intervals. The student inserts the number of his choice on the score pad. After a series of about eighteen questions, a frame appears with the correct answers.

Student interest is maintained because it is a race against time. The frame changes every few seconds. There is no backing up, no second guesses.



WHAT'S NEW

Training in Literature



REVIEWED BY TRAINING AIDS DIV. AAF

Revisions and Changes

IN accordance with the radiotelephone procedure as approved by the Combined Communications Board, the following War Department Field and Technical Manuals have been revised or changed and are being distributed (dates shown indicate latest editions):

FM 24-5, Signal Communication. Changes have been prepared to revise those portions of the manual that have been affected by new procedures.

FM 24-6, printed as Radio Operators Manual, Army Ground Forces. April 12, 1943.

FM 24-8, Combined Teletypewriter (Teleprinter) Procedure. New manual.

FM 24-10, printed as Combined Radiotelegraph (W/T) Procedure. January 20, 1943.

FM 24-11, Combined Operating Signals. January 17, 1943.

FM 24-12, Army Extract of Combined Operating Signals. April 5, 1943.

TM 1-460, revised as Radiotelephone Procedure for AAF.

TM 11-454, printed as The Radio Operator. Discusses procedure only.

TM 11-459, printed as Instructions for Learning International Morse Characters. This manual covers the instruction in International Morse characters, which previously was included in TM 11-454. April 21, 1942.

Want to Stay Alive?

IF YOU are going overseas, you would do well to study carefully, and if possible carry with you, copies of these pocket-size publications:

Survival, by the Airlines War Training Institute.

Arctic Emergencies, by the Flight Control Command.

Jungle and Desert Emergencies, also by the FCC.

These handy booklets contain valuable information on what to do and what not to do, what to wear, what to eat, and other details well worth knowing in case of a sea, desert, jungle or arctic emergency.

Equally informative on the same subjects are publications of the Arctic, Desert & Tropic Information Center, Eglin Field, Fla. Here are the titles of some of the bulletins: *Forced Landings and Desert Survival*, *Aircraft Maintenance in the Desert*, *Desert Operations*, *Jungle Notes*, *Notes on Arctic Living and Ocean Survival*.

Some of these publications have been widely distributed in the AAF. The importance of the subject matter cannot be emphasized too strongly.

Instrument Flying

THE field of instrument flying is covered by four new, fully illustrated Technical Orders. They are:

T.O. No. 30-100A-1, Instrument Flying, Basic Theory and Practice.

T.O. No. 30-100B-1, Instrument Flying, Advanced Theory and Practice.

T.O. No. 30-100C-1, Instrument Flying, Instrument Flying Trainer, Instructor's Guide.

T.O. No. 30-100D-1, Instrument Flying, Technique in Weather.

For Supply Officers

AIRBORNE radio equipment is treated comprehensively in a handbook recently prepared by the Signal Section, Air Service Command, Patterson Field, Ohio. This publication is approved for distribution in the Air Service Command, but copies may be obtained from the ASC by interested personnel of other commands. The prime purpose of this manual is to "speed up" the training of inexperienced supply officers and help them become more familiar with the different types of equipment in the shortest period of time.

"The Squadron Communications Officer"

The specific technical duties of the squadron communications officer are described in this film (TF 1-717), which is intended principally to orient squadron communications officers who are new at their jobs. The film also points out many of the general administrative duties the communications officers may be called upon to perform.

"Pre-Flight Radio Inspection For Fighter Aircraft"

This film (TF 1-771) illustrates visual and operational checks made in the pre-flight inspection of the SCR-522 as installed in the P-47. It also points out the similarity of this procedure to inspection of the SCR-274 installed on other types of fighter aircraft.

"Airplane Engine Cooling Systems — For Pilots"

The third film of a series on airplane engine cooling systems (TF 1-758) describes for pilots the correct procedures for operating engine controls on liquid-cooled and air-cooled aircraft engines

in order to insure effective cooling. Although the first part of the film is devoted to an explanation of the principles of cooling systems, the major portion deals with the various controls which affect engine temperatures and the optimum operating conditions. Two other films previously released in this series are for the engine mechanic and deal with maintenance and service of the cooling system: TF 1-756 "Airplane Engine Liquid-Cooled Systems—For the Mechanic," and TF 1-757 "Airplane Engine Air-Cooled Systems—For the Mechanic."

"Oxygen Equipment — Servicing High-Pressure Removable Cylinders"

This reel (TF 1-489) shows the procedures that must be followed in refilling high-pressure removable oxygen cylinders on aircraft. It emphasizes the care that must be observed in such operations, particularly stressing safety precautions for personnel servicing high-pressure oxygen equipment. Previously released in this same series are TF 1-488 "Oxygen Equipment—Types and Use at High Altitudes," and TF 1-487 "Oxygen Equipment—Servicing Equipment in the Airplane." ☆



"Take-Offs"

Released for AAF distribution last month, "Take-Offs" (TF 13305) serves as a basic instructional film for flying students and provides an effective refresher lesson for advanced pilots. This new film on flying techniques covers the main points involved in executing take-offs, stressing safety factors and coordination of flight controls. Other titles in the same series to be released at an early date include "Landings" and "Elementary and Pylon Eights."

considerations in their construction. Moreover, they are always located so that expansion can take place; in fact, our largest "Strips" already exceed anything existing airports can produce in runway length. From a cost standpoint, you can build over 15 adequate "Flight Strips" for the cost of a single suitable airport. The difference in maintenance costs is even more impressive. In fact, an entirely new "Flight Strip," with all necessary requirements as to width and length of runway, can be built more reasonably than an existing runway on an airport can be changed over into a makeshift landing area to accommodate modern cargo aircraft. Thus, it doesn't take too much imagination to foresee "Flight Strips," located outside cities away from fog and smoke belts, where cargo (and even passengers) can be unloaded and transported by truck and car to the centers of population.

Along established air routes "Flight Strips" would be the stepping stones or staging fields, not only as auxiliary landing areas for emergency use, but as air cargo or passenger "yards" for local deliveries. Add the possibility of glider-train transportation and you visualize a not unlikely air service of the future. Off civil air routes, "Flight Strips" could be utilized for feeder airline service.

Our third major consideration concerns "Flight Strips" and international air traffic — present and future. For while the catchword has become "freedom of the air," we might well substitute "freedom of the airports" as the key to the problem. You can have all the free air you wish, but aircraft must land and take off and for that you need landing areas.

Again, I will not attempt an overall discussion of the subject, with so much thinking left to be done about the job at hand, except to say that development of the

which you will operate. Learn at least a few words of their language, words that will help you communicate your wants. Learn something about native customs.

b. Approach the natives with a friendly attitude. Don't display arms. Don't show fright. Assume that they will help you. Be patient. Get them to do things by indirect hints, such as a display of restlessness on your part. But never show anger — they won't be driven. And play fair with the natives; if you make a promise, keep it.

c. Carry things on your person that the natives will want and use them for rewards. They are a vital help. Carry trinkets, tobacco twists and razor blades. Strips of silk from your parachute will be highly prized. But don't give all your wampum away at once. Ration it carefully — you may need some later on. In many areas you can write out a chit which will bring a reward to the bearer on presentation at a missionary station or mili-

'FLIGHT STRIPS'

(Continued from Page 10)

"Flight Strip" program in this country under federal supervision is in direct contrast to the development of airports under local ownership. Many applications of this plan have a direct relationship to international affairs, since you may substitute international agreement for federal supervision and national ownership for local ownership.

Although the Army Air Forces assisted

ANSWERS TO QUIZ ON PAGE 26

1. All four colors.
2. (c) A fighter plane.
3. Zooming to meet our thunder.
4. (a) Navigator.
5. (d) Aerial Gunnery
6. (d) A maneuver in flight.
7. Left side.
8. (a) Focke-Wulf. (c) Dornier.
(b) Junkers. (d) Heinkel.
9. (a) Elevators.
10. (d) Government Issue.
11. (c) Matériel.
12. (c) The command HALT is given as either foot strikes the ground.
13. (d) Drag.
14. (d) All members of the Army and their dependents.
15. Away from his neck.
16. 1530.
17. P-47.
18. Distinguished Flying Cross.
19. Purple Heart.
20. Communications.

the Canadians in every way possible to develop the airports along the Highway, the Canadians naturally consider them Canadian airports. The Highway's "Flight Strips," on the other hand, were developed entirely under the supervision of the Army Air Forces, which selected the sites with the approval of the Canadian government and asked the U. S. Public Roads Administration to make plans and

surveys in accordance with standard "Flight Strip" specifications.

Although both Americans and Canadians are stationed at the airports, each airport is under a Canadian manager. The "Flight Strips" are under the jurisdiction of the road officials who are responsible for building and maintaining the Highway.

The significant point is this: The airports, like all airports, are locally owned, and after the war can be expected to be locally controlled, in this case by the Canadian government.

"Flight Strips," by their very definition, are a part of a highway right-of-way, and are always adjacent to a public highway. Their status is the status of the Alcan Highway: Title rests with Canada because it is their land; construction, maintenance and use are covered by an international agreement between the governments of the United States and Canada. Thus, the "Flight Strips" adjacent to the Alcan Highway form the first chain of international landing areas.

After the war, "Flight Strips" in Canada, in this country, or in any part of the world, should always be a part of the same laws which govern the construction, maintenance and use of highways. If it is an international highway, as is the Alcan Highway, then "Flight Strips" become international "Flight Strips" to be utilized by mutual agreement between nations.

In this country we have developed these landing areas for aircraft through the joint efforts of Congress and the War Department, the United States Public Roads Administration of the Federal Works Agency, State legislatures and State road administrations, private industry and private organizations, and a host of individuals, principally those in the rural areas. ☆

BAIL OUT OVER BUNA

(Continued from Page 13)

tary outpost. Most natives understand the use of the chit.

2. Before you set out on a mission, make sure you have with you all the emergency equipment you might need. Always carry your jungle kit. Be sure to have *on your person* at least the following: matches in a waterproof container, a compass, a sturdy knife, maps of the area, sulfanilamide (preferably in powder form, for wounds that infect rapidly in the tropics), quinine (for malaria, a constant tropical hazard), halazone tablets for purifying water. You'll need these essentials. Wear G.I. boots or a sturdy equivalent that won't snap off if you have to bail out. Keep your shirt on, figuratively as well as literally. If you can salvage your pistol, so much the better.

3. Above all else stay calm when you are face to face with an emergency. When

you get down, sit for awhile and think things through. Prior knowledge of the terrain, the natives, and the conditions under which you are operating will prevent panic. In bail-outs, take extreme caution if you land in a tree. Many men have sustained injury coming down from trees. Of course, you're anxious to hug the earth. But play safe and come down slowly and deliberately. The ground will still be there when you get down and will feel a lot better than if you come down in a hurry on your head or back. ☆

PICTURE CREDITS

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OFFICERS' CLUB

(DOMESTIC)

By Lieutenant William T. Lent



Officers' hats on the shelf have about as much individuality as a belt of 50-caliber machine-gun bullets. Here's what happened when the Unit Personnel Officer and the Special Service Officer left the cloak room during a heated discussion of last night's G.I. stage show.

In this corner we have a few of the flying officers (witness the functional headgear); hopelessly trying to beat the one-arm bandit. The Operations Officer has been stalking the machine for half an hour and now he figures it is just about ripe. He'll probably hit the jackpot with his fourth nickel but will put it all back in.



Pity the poor Chaplain, unto whom all grief gravitates. At the moment he's stuck with the A. & R. Officer's autobiography. When they get to the Illinois-Michigan game of '23, in which his nibs scored 3 touchdowns in the last 90 seconds of play, with a cracked clavicle, the Chaplain will remember an important engagement elsewhere.



Lieutenant Lardoon, Mess Officer, is taking a busman's holiday dining at the Club. He'll wind up in the kitchen leaving a new calorie chart for an indignant chef. That's the Post Surgeon, on the left, with a carnivorous appetite and case-hardened stomach.

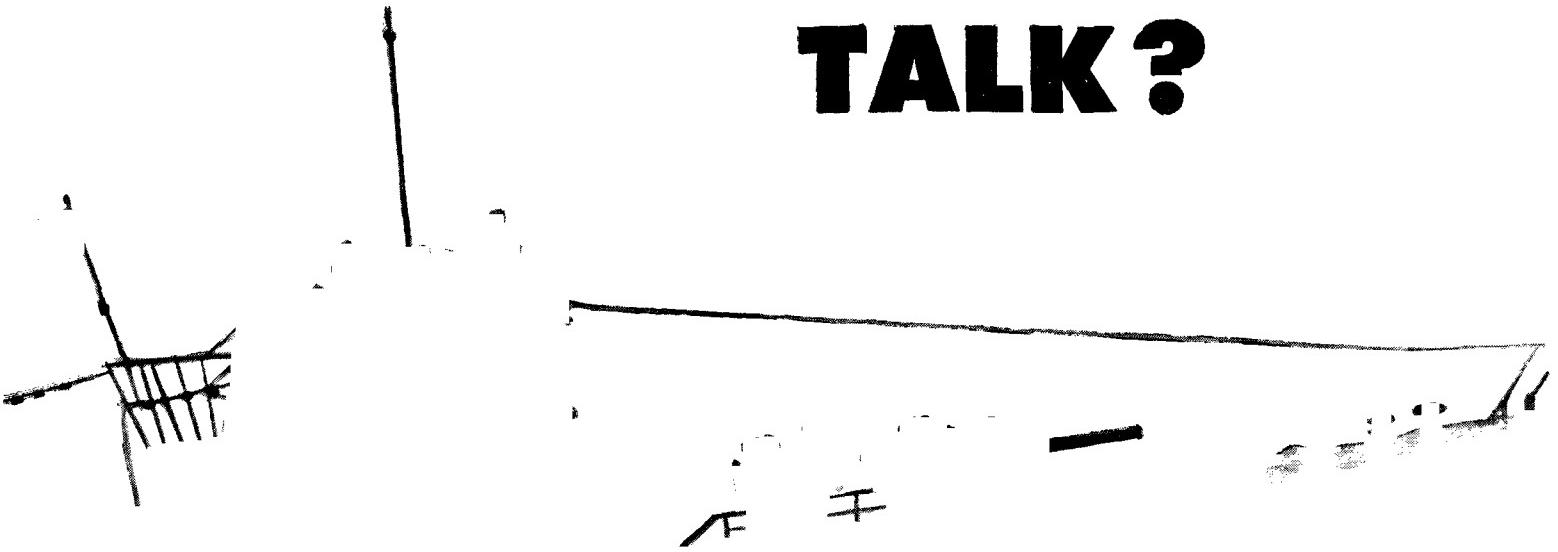
Colonel Bustle, Post Commandant, and his partner, Major Plato, S-3, are sweating out a spade finesse through the Supply Officer. Cautious Captain Little, Post Adjutant, holds the King but will probably save it, along with the C.O.'s temper.



Major Galley, combination Public Relations Officer, S-2 Officer, Photo Officer and Group Commander, has just been called to the phone between bites of hamburger to answer the query of the local newspaper editor concerning the forthcoming visit of the Paraguayan President. The Major will return to his cold coffee and then dash madly off to the OCS board meeting.

**ARE YOU
GUIDING
THIS U-BOAT
WITH**

TALK?



AIR FORCE

THE OFFICIAL SERVICE JOURNAL

OF THE U. S. ARMY AIR FORCES



SEPTEMBER 1943

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AIR FORCE

THE OFFICIAL SERVICE JOURNAL
OF THE U. S. ARMY AIR FORCES

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AIR FORCE is primarily a medium for the exchange of ideas and information among Army Air Forces personnel. Opinions expressed by individual contributors do not necessarily express the official attitude of the Army Air Forces or the War Department.

September Briefer

"INSPECTION concerns every man in the Army Air Forces, from the private who pours gasoline into a plane to the general who ordered its flight." In this manner Brig. Gen. Junius W. Jones, the Air Inspector, explains the need for a medium to disseminate AAF inspection information to the field. To fill this need AIR FORCE this month inaugurates a new department, prepared by the Air Inspector's office, to bring timely tips to inspectors and inspectees. Read "Prepare for Inspection" on Page 18. It should be of interest to all personnel.

BEFORE planes can be employed against the enemy, they must have bases from which to operate. Providing forward airdromes for AAF aircraft in the North African campaign was the job of our aviation engineers. An article which Brig. Gen. S. C. Godfrey, the Air Engineer, terms "the best evidence yet presented on rapid airdrome construction for a large air force in a new theatre," has been written for AIR FORCE by Brig. Gen. D. A. Davison, Chief Engineer for the Northwest African Air Forces. It appears on Page 14.

MAYBE you won't believe it but it's true: Women are flying our combat planes. Yes, the gal pilots in the Women's Auxiliary Ferrying Squadron are now breezing from factory to airfield at the controls of fighters, medium bombers and transports, as well as trainers and liaison ships. Of course, they stick to straight flying—no didos or high altitude stuff—but they're flying them just the same. An article on the first year of the WAFFS, and the women pilots' transition from the lighter planes to the combat ships appears on Page 10. Incidentally, the "Flying Jenny" on the cover is Miss Nancy E. Batson, 23-year-old Alabama ferry pilot, who joined the WAFFS last October. Her aviation background: CPT at University of Alabama; pilot rating in 1940; control tower operator for Pan American in summer of 1942; instructor at Embry-Riddle School of Aviation. Personal: blonde; 5 feet, 7 inches tall; not married; not engaged. Accent: decidedly southern.

LAST DECEMBER the Air Service Command was reorganized on a business basis because the Command's activities were "more closely related to those of business

management than of military operation." How the ASC functions under this reorganization—which meant principally a decentralization of authority at the same echelon—is described on Page 40 by Maj. Gen. Walter H. Frank, its commanding general.

THE EMPLOYMENT of air power in the Battle of Attu is described on Page 22 by Brig. Gen. William E. Lynd, Army Air Officer on the Staff of the Commander in Chief of the Pacific Fleet. General Lynd, who has seen extensive action in the Pacific, participating personally in many important bombing missions against the enemy, took an active part in the Attu operation.

SEVERAL months ago, the Civil Air Patrol became an auxiliary of the Army Air Forces. In addition to carrying on its coastal and border patrol duties, CAP has now been assigned to the important nation-wide AAF recruiting drive. Its 60,000 members are charged with investigating, examining and qualifying candidates to eliminate the unfit before they are certified to the cadet examining boards. The work of the CAP and its future possibilities are described in an article on Page 46 by Lieut. Col. Earle L. Johnson, the CAP's national commander.

TO A PILOT in the ATC's "special mission" group, Chungking is just a spot on the map where the weather officer owes him six bucks; Cairo, where the British nurse has promised him a date on his next visit; Melbourne, where he has to pick up last week's laundry. It's tough, serious work getting cargo to all points of the earth in record time, but these pilots laugh off their assignments as strictly routine. An article on this group appears on Page 30.

"RIDING the Messerschmitt Maytag," on Page 48, is a straight-forward account by a former cadet of how he felt about washing out in primary. The author is Private Charles M. Macko, who has been reclassified at a basic training center at Fresno, Calif., to become a student under the Army Specialist Training Program. He flunked his final check ride at Thunderbird Field, Ariz., early this year. But, he writes, "disappointed as I am, I can appreciate the Army's aim. It wants the cream of the crop to make the best pilots in the world."

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CROSS COUNTRY

OUR score against enemy planes for the first six months of the year stood at 3,515 of the enemy destroyed, with an additional 1,127 probably destroyed and 1,280 damaged, according to an announcement by the Commanding General. During this period 846 of our aircraft were lost in aerial combat.

Bombardment planes, meanwhile, carried out their primary mission in every theatre, dropping millions of pounds of bombs on enemy industrial plants, lines of supply and communication, and military and naval installations. Our score against enemy shipping was reported as 121 surface craft sunk, 74 probably sunk and 315 damaged.

All in all, our aircraft flew 89,691 combat sorties in the six-month period. (A month-by-month box score of our aerial combat operations, by theatres, for the first half of 1943 is on the next page.)

RETURN FROM COMBAT

The Commanding General also announced that more than 9,000 officers and enlisted men of the Air Forces with combat experience had been brought back to the States to train our personnel in the actual details they will encounter overseas. General Arnold reported:

"No faculty more thoroughly equipped by long, direct, personal experience could be assembled than this group of fighting men now communicating their hard-won knowledge to their brothers in arms."

"All sick and wounded Army Air Forces personnel evacuated from the theatres of operations are sent to Army Air Forces hospitals not only for medical and surgical care but also for a full study of their cases as relating to aviation medicine. The patient is evaluated both medically and aeronautically to determine for what type of aeronautical duty he is qualified."

"These qualifications are weighed against his physical defects. Reassignment of duties may be indicated. While the physical defects are being corrected, he receives instruction in the new duties which he will undertake. Thus, no part

A report on our combat record, and other developments of the month within the Army Air Forces.

of his training and experience is lost to the Army Air Forces."

The largest single group of our personnel returned from foreign theatres—1,024 officers and 1,654 enlisted men—has been assigned to the Second Air Force. Distribution of returned personnel to other commands was reported as follows:

First Air Force, 267 officers and 361 enlisted men; Third Air Force, 683 officers and 527 enlisted men; Fourth Air Force, 268 officers and 552 enlisted men; Air Service Command, 310 officers and 351 enlisted men; Air Transport Command, 40 officers and no enlisted men; Materiel Command, 42 officers and 10 enlisted men; Flight Control Command, 57 officers and 87 enlisted men; Proving

Ground Command, 35 officers and 3 enlisted men; Antisubmarine Command, 48 officers and 109 enlisted men; Technical Training Command, 152 officers and 97 enlisted men; Troop Carrier Command, 118 officers and 55 enlisted men.

STRICTLY PLATONIC

There is no denying the value of the work being done at the various rest centers, but we can't help passing on the story about the fellow who had been appointed a club director by one of the welfare agencies and was being coached in his duties preparatory to being sent overseas. During one of the lectures the woman in charge held forth at some length on the needs of flyers returning from combat.

"Some of these men," she said, "will be sent back to your club for extended rest periods after having 100 or 150 grueling hours of combat duty. They will come to you in need of relaxation and recreation."

The good lady paused to let the thought sink in. "Now," she continued, "when these combat flyers come in what are you going to give them? Are you going to give them coffee and doughnuts? No, certainly not! Not when there are plenty of good dehydrated soups."

GLOBAL WAR

Among the prisoners taken in North Africa was a Polish soldier who had been captured by the Russians in 1939, released by them after the German invasion of Russia to serve in the Russian army in 1940, taken prisoner by the Germans in 1941, drafted into the German army in 1942, transferred to North African duty and finally captured by American troops in Tunisia in 1943.

THE AAF TRAINING COMMAND

The new AAF Training Command was activated July 7 to replace and combine the functions of the Technical Training Command and the Flying Training Command. Maj. Gen. Barton K. Yount, former head of the FTC, was named com-



COMBAT BOX SCORE

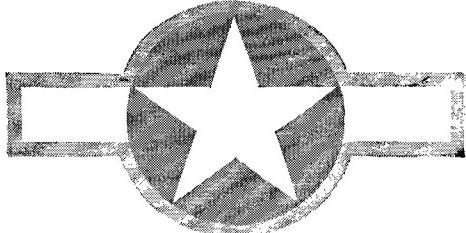
Following is a month-by-month box score of United States Army Air Forces combat operations in theatres of operations for the first half of 1943:

| | Aerial Combat Enemy Losses In | | | On Ground Enemy Losses | | | U. S. Aircraft Losses | |
|--------------------------------|----------------------------------|---------------|--------------|---------------------------|---------------|--------------|-----------------------------|--|
| | Lost | Prob- able | Dam- aged | Lost | Prob- able | Dam- aged | in Aerial Combat | |
| January | | | | | | | | |
| 8th AF United Kingdom..... | 57 | 34 | 22 | — | — | — | 15 | |
| U. S. Units, N.W. African AF.. | 144 | 63 | 75 | 31 | 6 | — | 86 | |
| 9th AF Middle East | 11 | 8 | 7 | — | — | — | 5 | |
| 5th AF Australia | 151 | 55 | 41 | 6 | 7 | 3 | 9 | |
| 13th AF So. Pacific | 34 | 3 | 1 | — | — | 7 | 7 | |
| 10th AF India | — | — | — | — | — | — | — | |
| 14th AF China | 8 | 5 | — | — | — | — | 1 | |
| 11th AF Alaska | — | — | 1 | — | — | — | — | |
| Total | 405 | 168 | 147 | 37 | 13 | 10 | 123 | |
| February | | | | | | | | |
| 8th AF United Kingdom..... | 72 | 28 | 12 | — | — | — | 18 | |
| U. S. Units, N.W. African AF.. | 128 | 37 | 73 | 6 | 3 | — | 78 | |
| 9th AF Middle East | 8 | 7 | 1 | — | — | — | 3 | |
| 5th AF Australia | 41 | 21 | 6 | 5 | — | — | 7 | |
| 13th AF So. Pacific | 26 | 1 | 1 | — | — | — | 17 | |
| 10th AF India | 16 | 14 | 2 | 6 | — | — | — | |
| 14th AF China | — | — | — | 18 | 1 | — | — | |
| 11th AF Alaska | 7 | — | 4 | — | — | — | — | |
| Total | 298 | 108 | 99 | 35 | 4 | — | 123 | |
| March | | | | | | | | |
| 8th AF United Kingdom..... | 141 | 43 | 56 | — | — | — | 17 | |
| U. S. Units, N.W. African AF.. | 143 | 50 | 86 | 24 | 10 | — | 46 | |
| 9th AF Middle East | 17 | 4 | 12 | — | 6 | — | 7 | |
| 5th AF Australia | 91 | 39 | 15 | — | 3 | — | 11 | |
| 13th AF So. Pacific | 4 | — | — | — | 5 | — | — | |
| 10th AF India | 8 | 4 | 17 | 1 | — | — | 4 | |
| 14th AF China | — | — | — | — | — | — | — | |
| 11th AF Alaska | 2 | 2 | — | — | — | — | 1 | |
| Total | 406 | 142 | 186 | 25 | 24 | — | 86 | |
| April | | | | | | | | |
| 8th AF United Kingdom..... | 148 | 43 | 31 | — | — | — | 30 | |
| U. S. Units, N.W. African AF.. | 318 | 84 | 126 | 118 | 2 | 56 | 60 | |
| 9th AF Middle East | 152 | 28 | 48 | 1 | — | — | 20 | |
| 5th AF Australia | 70 | 16 | 8 | 6 | — | — | 17 | |
| 13th AF So. Pacific | 17 | — | — | — | — | — | 12 | |
| 10th AF India | 1 | 2 | 7 | — | — | — | 1 | |
| 14th AF China | 16 | 13 | — | — | — | — | — | |
| 11th AF Alaska | — | — | — | — | — | 10 | — | |
| Total | 722 | 186 | 220 | 125 | 2 | 66 | 140 | |
| May | | | | | | | | |
| 8th AF United Kingdom..... | 348 | 127 | 172 | — | — | — | 70 | |
| U. S. Units, N.W. African AF.. | 215 | 51 | 69 | 76 | 46 | 37 | 62 | |
| 9th AF Middle East | 20 | 10 | 14 | 9 | — | 10 | 28 | |
| 5th AF Australia | 29 | 10 | 10 | 4 | 4 | 3 | 8 | |
| 13th AF So. Pacific | 3 | 1 | 1 | — | — | — | 7 | |
| 10th AF India | 9 | 10 | 11 | — | — | — | 9 | |
| 14th AF China | 58 | 23 | 2 | 14 | 10 | 1 | — | |
| 11th AF Alaska | 5 | 7 | — | 1 | — | — | 5 | |
| Total | 687 | 239 | 279 | 104 | 60 | 51 | 189 | |
| June | | | | | | | | |
| 8th AF United Kingdom..... | 325 | 96 | 157 | — | — | — | 83 | |
| U. S. Units, N.W. African AF.. | 171 | 42 | 52 | 11 | 1 | 1 | 70 | |
| 9th AF Middle East | 40 | 23 | 8 | 8 | — | — | 2 | |
| 5th AF Australia | 41 | 4 | 2 | 3 | 6 | — | 19 | |
| 13th AF So. Pacific | 63 | 1 | — | — | — | — | 6 | |
| 10th AF India | — | — | — | — | — | — | 1 | |
| 14th AF China | 9 | 8 | 2 | — | — | — | 4 | |
| 11th AF Alaska | — | — | — | — | — | — | — | |
| Total | 649 | 174 | 221 | 22 | 7 | 1 | 185 | |
| Grand Total | 3167 | 1017 | 1152 | 348 | 110 | 128 | 846 | |

manding general of the new Command with headquarters in Fort Worth, Texas. "The reorganization was effected," according to the announcement from AAF Headquarters, "to achieve maximum economy of operations, the most efficient utilization of personnel, and maximum coordination of training schedules and utilization of training facilities." In future issues, AIR FORCE will publish details of the Command's activities.

NEW PLANE INSIGNIA

Not long after the conflict opened in the Pacific, the red dot was removed from the star in the insignia of AAF planes because it was being confused with the rising sun painted on Jap aircraft. As the war against the Axis moved on, it became apparent that at certain distances the white star against a blue background on our planes, the black cross superimposed on



a wider white cross on Nazi aircraft, and the Japs' red dot, all appeared in the form of a dot because all angular features take this form at great distances. In July the AAF took the lead in removing this lack of distinction by adopting a new insignia consisting of the white star on a circular field of blue, a white rectangle attached horizontally at the right and left of the circle, and a red border enclosing the entire device. Result of tests: visibility at a sixty percent greater range than the old device and the German and Jap insignia, with a distance effect of a long, narrow bar rather than a dot.

MONSTER JEEP

In the way of compliments, we thought they had thrown the book at the vehicle called the Jeep, and figured the matter would have to rest until some fresh adjectives turned up. But we feel bound to report that the enemy has outdone us.

For evidence we are going to quote you the text of an Italian order captured by our forces in North Africa. It was signed by the commanding officer of an Italian anti-tank regiment. And believe us, this is the real thing (the italics are ours).

"Subject: Enemy Jeeps.

"To: Commanders, 1,2,3 Bns.

"It is time to debunk the legend according to which 'Jeeps' seem to be considered *uncatchable monsters*.

"Some anti-Jeep actions which I have instituted recently, even with small groups of riflemen, have led to the capture of three of the vehicles in question and some prisoners.

"By these actions, I have been able to

establish that the crews of these Jeeps, when met by decisive action, make their escape or surrender without opening fire but, when not so met, open fire, inflict losses on us and make their getaway.

"You are requested to draw from the above, arguments designed to raise the morale of your units, so as to secure that, by the cooperation of everyone, we succeed in freeing the lines of communication from this *insidious weapon* of enemy attack. Every commander should give strict orders to this effect."

"EXPRESSING OUR APPROVAL"

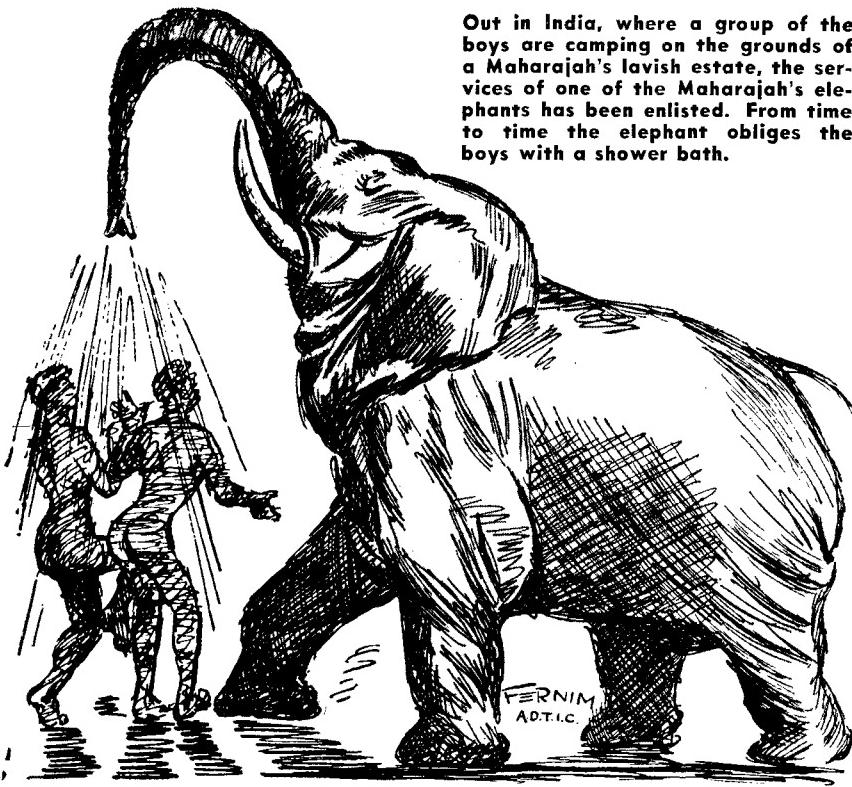
Back in the March issue we published an article by Maj. Wade R. Cunningham, Jr., Commandant of Cadets at Foster Field, Texas, entitled "What Kind of Officers Will They Make?" It was one of the best expressions we had seen of the relationship between cadets and supervising officers during advanced training.

This month we received a note from Foster Field enclosing the photostatic copy of a V-mail letter from "somewhere in North Africa." The letter was addressed to Major Cunningham and bore the signatures of nineteen officers who had received their advanced fighter pilot training at Foster before going on foreign duty. With the approval of the Foster Field CO, we're happy to reprint that letter, as follows:

"Dear Sir:

In reading the AIR FORCE magazine of March 1943, we are very happy to note your article entitled, "What Kind of Officers Will They Make?" We of the class of 42J who by chance happen to be stationed here at present take this means of expressing our approval of the ideas and ideals set forth in your article. Since our graduation, November 10, we have been several places, learned considerable, and have seen lots. It is our impression that a closer relationship between cadets and their supervising officers in advanced training will pay big dividends in the future. By way of an example, the period between cadet training and the stage of flight leadership at present is so short that experience alone is not competent. Then again the value of air discipline and, at the same time, teamwork and cooperation is best obtained through a complete understanding of all concerned. Naturally this must be first learned during cadet training for the earlier this is grasped, the better type of flying officer will be produced.

"We sincerely hope that all is well at Foster Field; for each of us has fond memories of what we consider the best, and without reservation, the most enjoyable period of our cadet training. We also wish you to convey to all that shared in our training at Foster Field the best of luck and good wishes. Then, of course, any news, items of interest or letters will be gladly received here in North Africa."



Out in India, where a group of the boys are camping on the grounds of a Maharajah's lavish estate, the services of one of the Maharajah's elephants has been enlisted. From time to time the elephant obliges the boys with a shower bath.

THAT FIRST MISSION

Fliers who are wondering about their first taste of combat may be interested to know that Lieut. Walter Schol, on his first combat mission, shot down a 35-year-old German veteran who had been decorated seven times. The action took place in North Africa. The German flew a ME 109G, Schol a P-40.

HOW'RE YOU VOTING?

It is one of those arguments which probably never will be settled, but the subject is inviting and we are anxious to do our part. We refer to the question of who is the better combat fighter pilot—the Jap or the German.

Lieut. Daniel Kennedy is a P-38 pilot with a few thoughts on the subject. Kennedy has been slugging it out with the Germans for the last eight months or so, which makes him a veteran in that theatre, and has shot down five enemy planes. According to Pvt. Wade Jones, who sent in this report from North Africa, Kennedy has more than 50 missions and 190 hours combat time to his credit. This is how Kennedy feels about the Jap-German pilot question:

"I read the other day," he is quoted, "that one of our fighter pilots out in the Pacific said the Jap pilots were better than the Germans. Now I haven't been out in that theatre—yet. But it just doesn't add up with the known figures. Some of our pilots out there have twenty or so planes to their credit, I hear. I've got five and the most any man in our Group has is eight. Of course they've been at it longer, but then I'll bet we've had more encounters than they have. So

if the Jap pilot is better than the German, how come so many more of them get shot down?

"Of course, I'd like to go back to the States if I can. But after that I want to go to the Pacific. Maybe I'm wrong but I bet I'd have more than five Zeros at the end of six months out there."

We were glad to get Lieutenant Kennedy's remarks and hope they will prompt further discussion. What about a line or two from the boys who have fought both the Jap and the German?

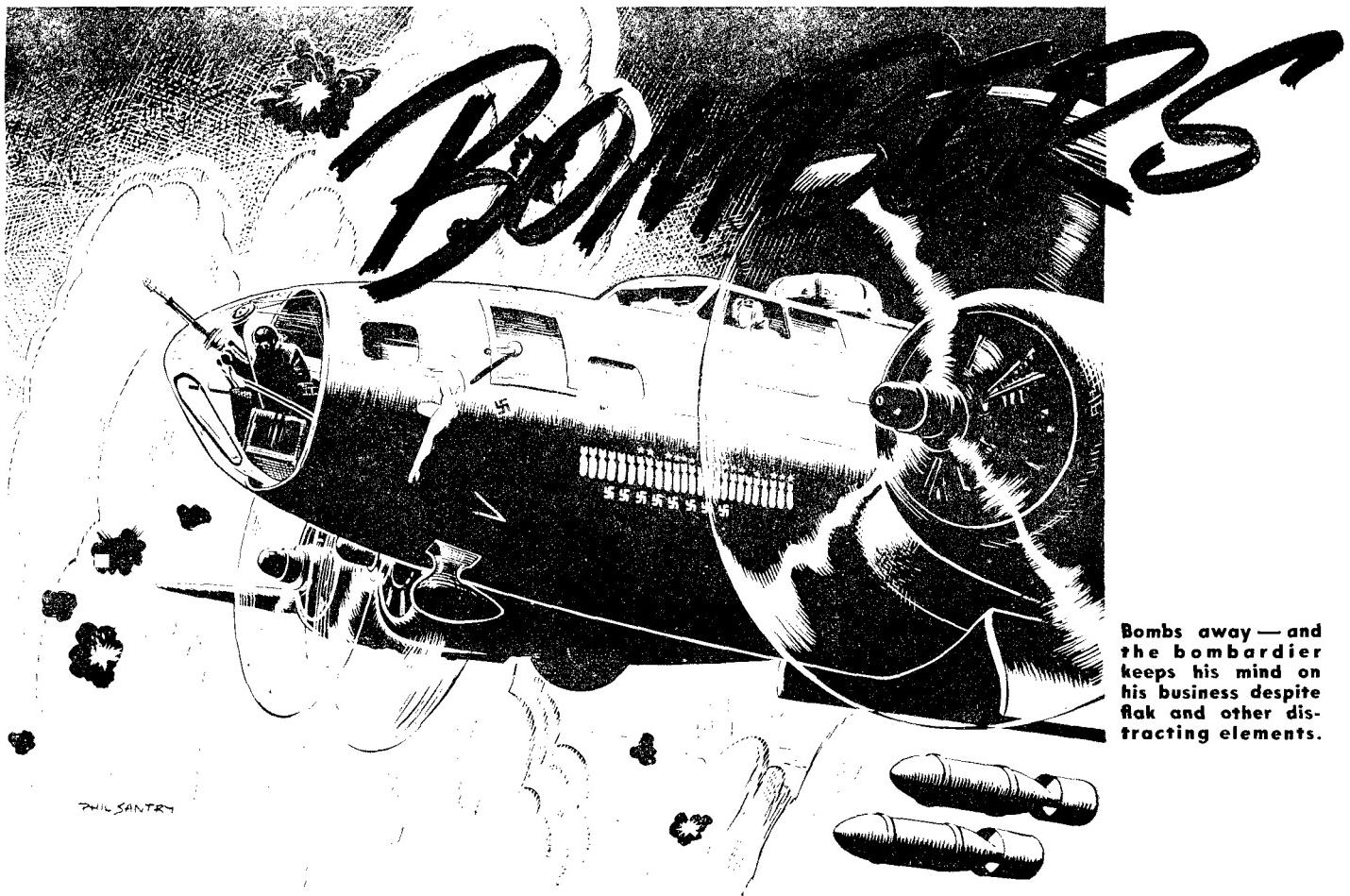
OUR APOLOGIES

On page 3 of the July issue, we stated that the Order of Daedalians was pioneered "under the leadership of the late Brig. Gen. Harold L. George," meaning the late Brig. Gen. Harold H. George, fighter commander who was killed in the Southwest Pacific in the early months of the war. Maj. Gen. Harold L. George is the commanding general of the Air Transport Command.

THE "MILITARY REVIEW"

We've been asked to inform you that the *Military Review*, quarterly publication of the Command and General Staff School, is now a monthly magazine. The *Review* publishes up-to-date professional military information, thought and doctrine, including translations and digests of important foreign military literature. The subscription price, \$3 per year, should be remitted by check or money order with each subscription to the Book Department, Command and General Staff School, Fort Leavenworth, Kansas.

—THE EDITOR.



Bombs away—and the bombardier keeps his mind on his business despite flak and other distracting elements.

As Allied invasion forces moved in on the European fortress last month, round-the-clock bombing of continental targets by American and British aircraft based on the British Isles continued with increasing tempo.

Major responsibility for daylight bombing missions remained the every-day job of AAF four-engine bombers manned by crews of the Eighth Air Force. As the

bombings increased—and more and more industrial centers and shipping points felt the blows—so increased Axis opposition. Fighter planes, the best the Nazis had to offer, and flak, often as thick as a blanket, tested the mettle of our airmen.

The Germans were trying every trick in the book—new tactical maneuvers with their fighters, air-to-air bombing, variations in flak concentrations and patterns.

A waist gunner can watch his tracers plow into an enemy fighter. This gunner already has chalked up a swastika.



The belly turret gunner thinks he has the best spot on the ship—mainly because he gets a crack at plenty of them.

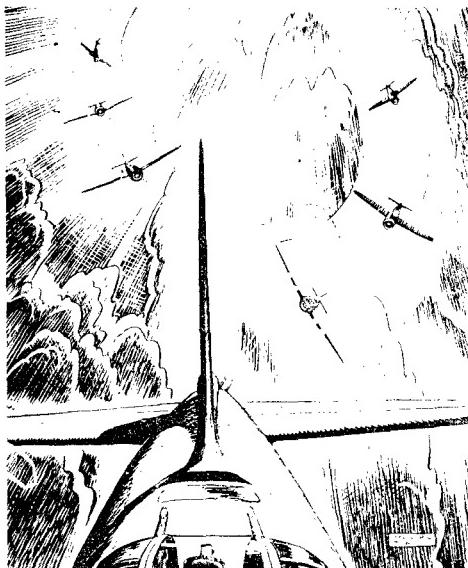


Our formations and tactics were constantly being changed to meet the enemy's new techniques.

Despite sterner opposition our crews and our planes are more than holding up. In a report to Headquarters, Maj. Gen. Ira C. Eaker, the Eighth's commanding general, commented:

"None of the crews has a feeling that they are overmatched. The bomber crews

From the top turret the gunner frequently gets an eyefull, too. He takes on attacking planes from many angles.



OVER EUROPE

nave a complete confidence in their ability to take a heavy toll of German fighters. It is not necessary to drive the men to their tasks, as they are enthusiastic about it.

"We employ all possible deception to avoid fighter concentration and radar detection. This is done in order to prevent interference with the bombing by enemy fighters. However, when a hot air battle results, we do not count the mission lost but consider it a victory when we destroy a large number of enemy aircraft."

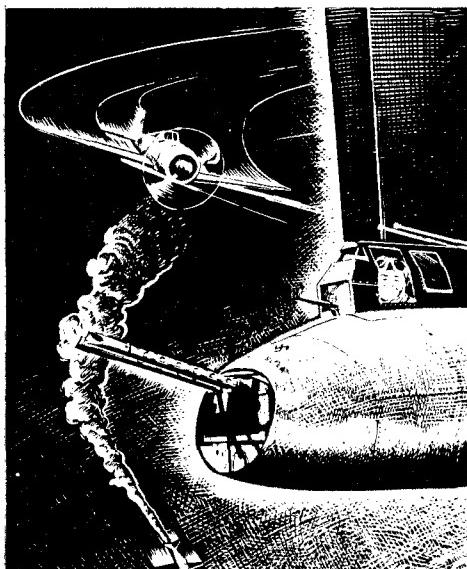
As always, the primary job was the destruction of production facilities of the Axis war machine, with shooting down enemy fighters a defensive sidelight of the main task.

Coinciding with the acceleration of Allied air operations over the Continent

Navigators have to train themselves to keep at their navigation; a tough assignment when the fighting is heaviest.



If a tail gunner gloats over one he shot down, another tough enemy might be looking him in the face before he knows it.



was War Department recognition of the first anniversary of American aerial participation in the Battle of Europe. On July 4, 1942, AAF crews, manning six A-20s, got their first taste of war over the occupied Lowlands. One year later, our airmen celebrated by taking over several hundred heavy bombers to paste targets at Le Mans, Nantes and La Pallice with 544 tons of bombs. They shot down 46 German planes, scored 36 probables and damaged seven more. Eight bombers were lost.

DURING that first year, the War Department reports, B-17s and B-24s of the Eighth Air Force destroyed or damaged 102 industrial targets, naval bases and rail centers with 11,423 tons of bombs on 68 daylight precision bombing missions.

They shot down 1,199 enemy planes, probably destroyed 525 more and damaged 501. We lost 276 heavy bombers.

Eighth Air Force 17s and 24s flew 7,067 sorties against Axis targets during the year and averaged only 3.91 percent losses. Enemy planes destroyed by these lost American aircraft in fighting before they were shot down are not included in the tabulation of enemy planes shot down, probably destroyed and damage¹.

The accompanying drawings represent an artist's conception of a typical bombing raid over Europe. Key positions in the crew of a B-17 are played up in the individual sketches, which were done by Phil Santry of the AAF Training Aids Division on the basis of reports obtained in Washington.

Action as portrayed in these drawings is the type of action that has become almost routine for our airmen engaged in daylight runs over enemy target areas on the European continent. ☆

In some tight spots, it takes the combined strength of pilot and co-pilot to kick the B-17 around in a vitally necessary evasive manner.





Maj. John Mitchell (left) and Capt. Thomas Lanphier, Jr. At top, a P-38 takes off from an airfield in the Southwest Pacific.

Be Ready FOR ANYTHING

By Capt. Charles D. Frazer

"YOU can't be too good a gunner," said the Major. "When you jump a Zero up there at 30,000 feet, you have him in range for just a few seconds. Hit him squarely and he'll go down. Miss him and you may get your tail shot off."

"I know a pilot who has flown 200 hours as a wing man and has saved his leader's life many times. But he still hasn't a confirmed victory of his own. All because of poor marksmanship."

"I'd have knocked down at least four or five more Japs myself had I been able to shoot a little better."

And coming from the Major, this really means something, for Maj. John Mitchell is one of the best. He is credited with eight Jap planes, has flown 100 operational missions involving 200 hours in combat, and commanded a P-38 squadron in the South Pacific which has a record of sixty Jap planes destroyed and twelve probables.

Capt. Thomas Lanphier, Jr., was a flight leader in this squadron. Seven planes, seventy missions, 175 hours in combat—that's his score.

Mitchell is soft-spoken, serious, thoughtful. Lanphier is nervy, quick-witted, inclined to tell a story with dramatic gestures. Both were in the South Pacific from January, 1942, until June of this year—first in the Fijis, then the Solomons—and both know what it takes to be a front-line fighter pilot.

"Out there," said Mitchell, "a pilot must be ready for anything. You fly night and day, in rain, fog and every kind of soup imaginable. You fly in and out of short, bumpy fields that have been just chopped out of the jungle."

"The physical strain is enormous. On the ground the atmosphere is hot and humid and enervating, and you are likely to be waiting around in this heat when a raid starts and the fighters have to get up fast. There's a tremendous change in temperature, the cockpit cools off quickly, and you have pains all over."

"To an experienced combat pilot, these things are part of the game. But to the new flyer they are new problems. And there is only one answer—prepare yourself as thoroughly as possible before you ever reach the front."

LANPHIER nodded his head rapidly.

"That's a good point, Mitch. Too many kids came out there trusting to luck. Well, you can't do that because there are two kinds of luck."

"For example, a lot of men seem to think they will have little or no occasion to fly on instruments. But they will, believe me. And it's absolutely essential that they know how."

"Others don't know enough about the equipment and how it works. Oxygen equipment, especially. We knew a fellow who bailed out of his airplane at about

30,000 feet when there was apparently nothing wrong. The only conclusion was that he lost his head from lack of oxygen.

"Then there is all the emergency equipment. We have seen priceless airplanes ruined just because some guy didn't know how to use the emergency landing gear handle."

"Keep in mind," said Mitchell, "that these mistakes are mainly a matter of neglect. During his training a pilot is given instruction in every phase of the job. But there are some things to which men in training don't pay enough attention."

"I can sum these up briefly. Gunnery, as I have said, can't be over-emphasized. We have daily gun practice out at the front but that can't make up for insufficient practice at home."

"Then there is formation flying and escort flying and night flying and instrument flying and practice in landing on short fields and a thorough knowledge of engines and dynamics. A man should put in every minute possible on those phases."

"Formation flying is vital. We fought the Japs all over the Guadalcanal and Solomons area for months and I can't remember a time when we weren't badly outnumbered."

"You can meet that kind of opposition in one way only—by sticking together. You *must* stay together, at least in pairs."

"This is probably the hardest idea to

get across to a new pilot. He arrives rarin' to go. The squadron commander keeps him out of combat for a while, sees that he brushes up on the phases of training I mentioned, and lets him watch the Tokyo Express go over a few times.

"At last he is sent on a combat mission. After all, that's the only way he can become a combat flyer. You can't practice a man into perfection.

"Well, those first two or three flights are tough for anybody. You're keyed up and excited and there's a hell of a lot of shooting going on and, first thing you know, this new kid breaks away from his leader. Perhaps he dives down and away after what he thinks is a straggler.

"If he gets home after leaving a formation like that, he is very lucky indeed. It won't happen often.

"A new pilot simply must accept the fact that his leader is experienced and must be trusted to get them through the brawl."

Mitchell and Lanphier concede that the conditions they faced in the Pacific, especially on Guadalcanal, were far worse than they are today.

Mitchell arrived at Guadalcanal in October, when the front lines were only half a mile from his tent, when machine gun fire and continuous bombing by Jap planes made sleep as unlikely as a visit

Two Army fighter pilots tell why it pays to be well-prepared for combat flying.

from a pin-up girl. Conditions had improved only slightly in December, when Lanphier reached Henderson Field. Food consisted of Spam three times a day, when it was available. If you wanted a floor for your tent, you watched carefully and grabbed the crate from a new airplane.

Flyers were in "combat" on the ground as well as in the air. Jap snipers were bold and frequently slipped through the lines, one getting so close he fired a bullet into the pilots' mess table. Blackouts at night were complete, of course. You sat around a while talking over operations, but the flies and insects drove you under the mosquito nets early.

AERIAL combat was touch-and-go for many months. Major Mitchell bagged his first Jap on October 9, two days after arriving at Henderson Field, got another on October 23 while on patrol over Guadalcanal and a third on November 7 while attacking an enemy naval force.

January was very active. Typical of the operations was a bomber escort mission on January 5, when Mitchell's flight of six P-38s was attacked by 25 Japs. The

flight destroyed three planes and probably three more. Later on, Mitchell led six P-38s against thirty Zeros over Guadalcanal, getting two himself, and on January 29 he took off alone before dawn and shot down a "Washing Machine Charlie" —a Jap bomber Type 97 that was making a low-level bombing and strafing attack on the field.

Mitchell flew thirteen missions to the Kahili-Shortland Island area, 315 miles from Henderson Field, and one day made the trip twice.

Lanphier's record is no less brilliant. On December 23, the first day he flew combat from Henderson Field, he brought down a Zero over Munda while escorting a bomber sweep. Lanphier flew 24 escort missions to Munda in a single month; a 400-mile round trip, frequently on a two-a-day schedule.

On March 29 Lanphier led a flight of P-38s, accompanied by a Marine pilot, against float Zeros at Poporang Island. They destroyed eight Jap planes, then sank a Jap destroyer with machine gun and cannon fire on the way home.

When, on April 7, the Japanese attempted to raid the Tulagi-Savo Island area with 98 planes, Lanphier got three Zeros. His flight of four P-38s overtook eleven raiders at 30,000 feet, first shot down three planes, then finished off the remaining eight.

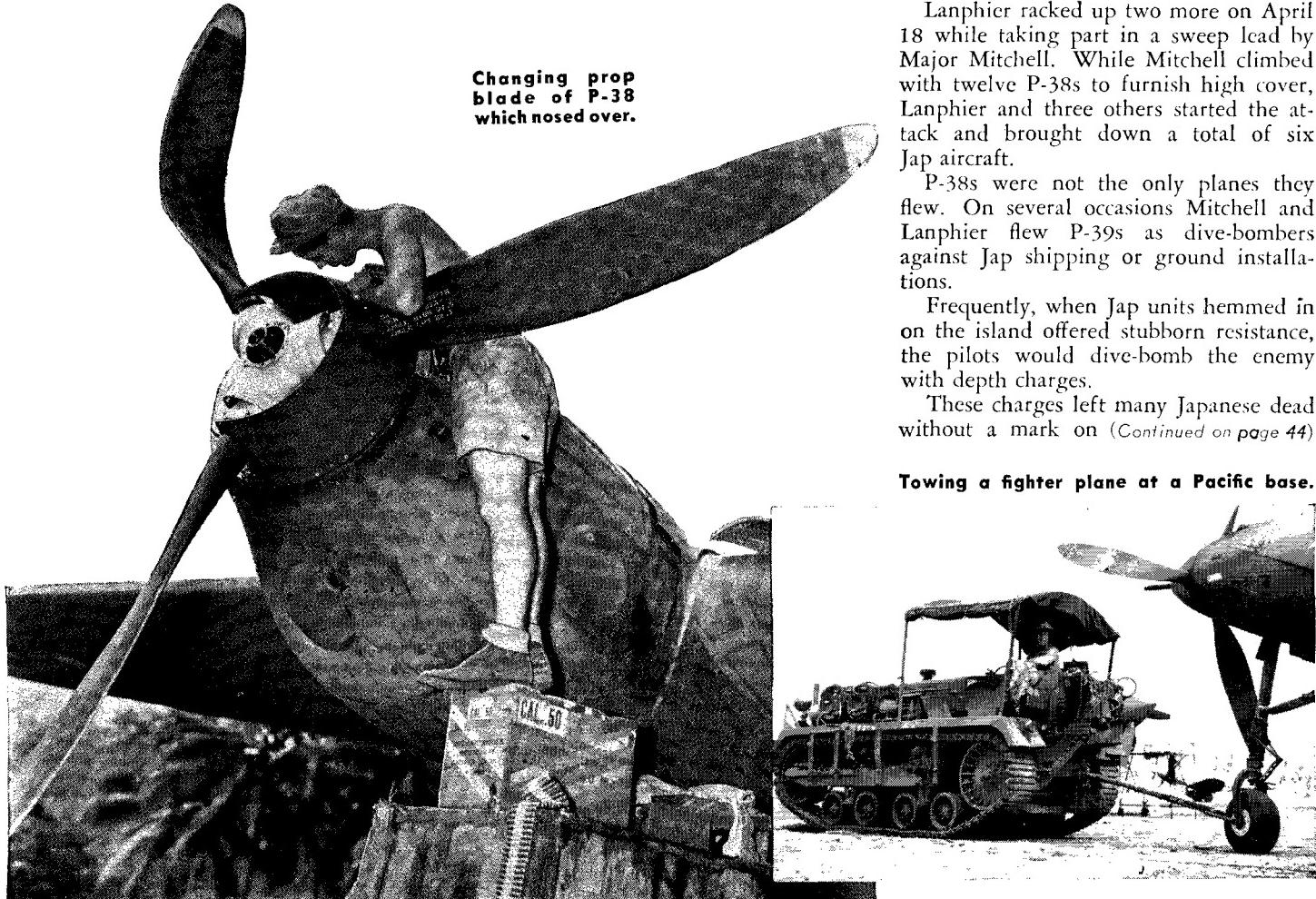
Lanphier racked up two more on April 18 while taking part in a sweep lead by Major Mitchell. While Mitchell climbed with twelve P-38s to furnish high cover, Lanphier and three others started the attack and brought down a total of six Jap aircraft.

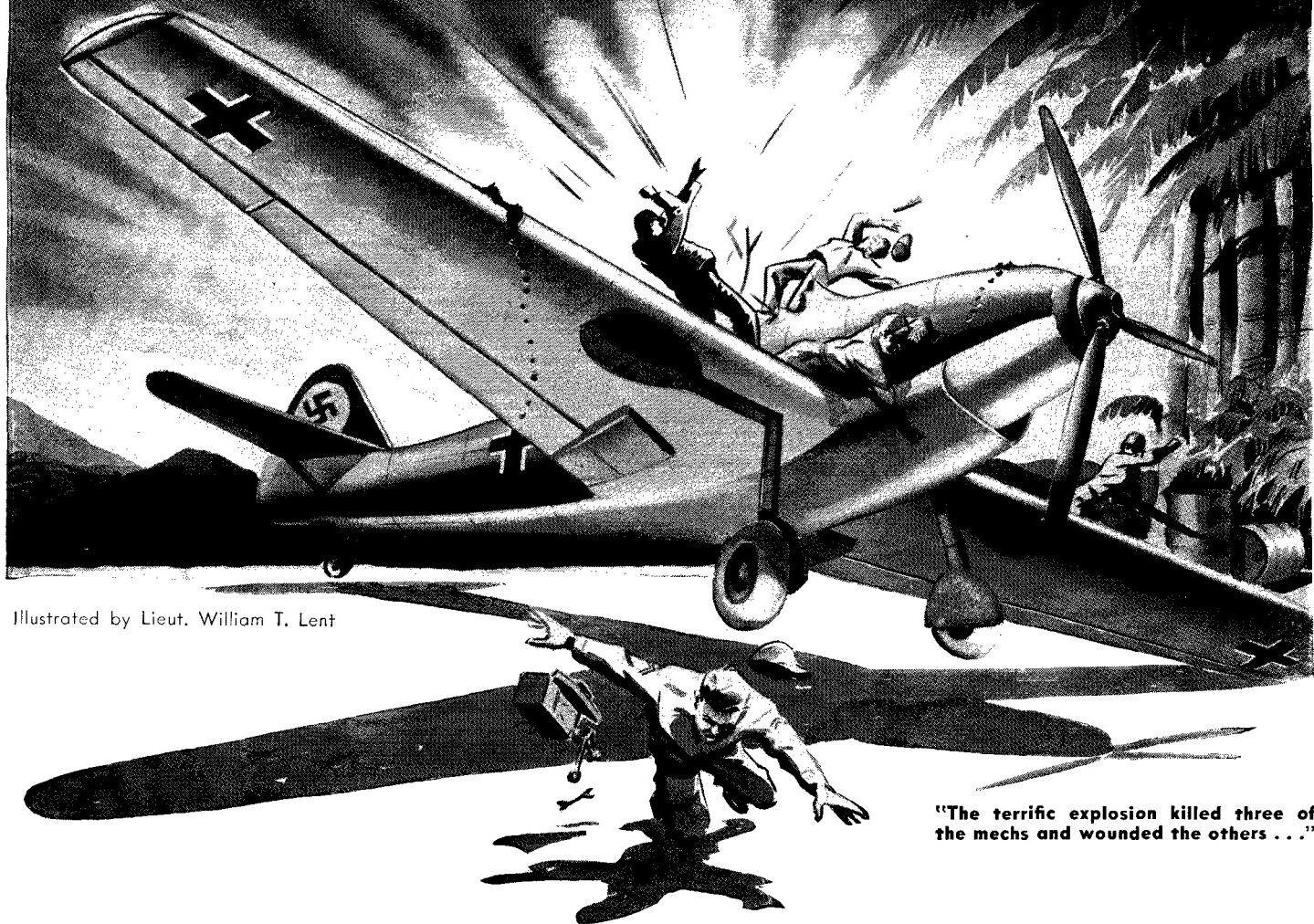
P-38s were not the only planes they flew. On several occasions Mitchell and Lanphier flew P-39s as dive-bombers against Jap shipping or ground installations.

Frequently, when Jap units hemmed in on the island offered stubborn resistance, the pilots would dive-bomb the enemy with depth charges.

These charges left many Japanese dead without a mark on (Continued on page 44)

Towing a fighter plane at a Pacific base.





Illustrated by Lieut. William T. Lent

"The terrific explosion killed three of the mechs and wounded the others . . ."

THIS IS YOUR ENEMY

-It's your life or his!

Twenty-two months of war have taught us many things.

We have learned that the enemy is not a superman—that he makes mistakes and miscalculations common to all men. We also know him to be a tough, smart fighter.

Reports from the combat zones tell of new techniques—and old ones applied more cleverly—with which the enemy is determined to outsmart us and outfight us. It is ample proof that we must know his methods as thoroughly as we know our own.

We must keep up with his tricks and his tactics, his propaganda, his national psychology, his strength and his weaknesses. We must be alert at all times—must take nothing for granted.

If you are inclined to be more curious than cautious, the enemy has special plans—and explosives—already laid for you.

Consider the ME-109 that sat there on a captured German airfield one spring day in North Africa. It looked harmless enough to the five mechs who jumped out of the jeep and ran to the plane. They crowded around the ship, comparing it with our own fighters. Then one of the more curious opened the cowling to investigate the instrument panel. The terrific explosion that followed killed three of the mechs and wounded the others.

More and more booty will fall into our hands as the Allied offensive rolls on. Often enough, as in this case, an aban-

doned piece of enemy equipment suddenly becomes a deadly weapon. The explosive charge hidden in the cockpit of the Messerschmitt did the work of a hand grenade or a bomb. The enemy had counted on our curiosity—and won!

Whenever possible, members of the Engineer Corps should inspect all captured enemy materiel. Engineers are trained to locate such traps and remove their explosive harmlessly. If the engineers don't happen to be around, only trained personnel should do the job. Regard every object left by the enemy as a potential booby trap. And if you discover possible traps, mark them well for the protection of others.

FAKE FOR BOMBARDIERS. The Germans have been known to flash on strings of phosphorous lights a few miles from the target to mislead our bombardiers. From the air the lights resemble incendiaries dropped by our own planes to light up the target. It is a ruse to trick bombardiers into dumping their bombs harmlessly in the phosphorous-light area.

☆ ☆ ☆

SNIPER PLAYS DEAD. One of the enemy can hold up a whole patrol—and inflict severe damage—when he plays it the smart way.

The smart guy in this case was a Jap sniper. He operated from a treetop and fired on an American patrol advancing up the New Guinea coast. The troops halted, located the sniper and fired. A body fell from a tree. The troops advanced and were fired on a second time. They stopped, fired, and scored another "kill." Then it happened all over again.

Investigation revealed that a single sniper had been holding up the patrol. The enemy had placed dummies in other trees and these dummies had been dropped by a pulley arrangement to make our troops think they had cleared the opposition.

The same technique was used elsewhere in the battle area. On one occasion the sniper's dummy was so regulated that it could be hoisted back into place. But the sniper wasn't invulnerable. He made the mistake of pulling the dummy back up too soon, giving away his ruse.

☆ ☆ ☆

ARMED PRISONERS. Walking toward you with hands held high overhead in the gesture of surrender, prisoners look very much alike. You're feeling pretty good about your position. Maybe you get a little careless. The prisoners have been disarmed, haven't they? Or have they?

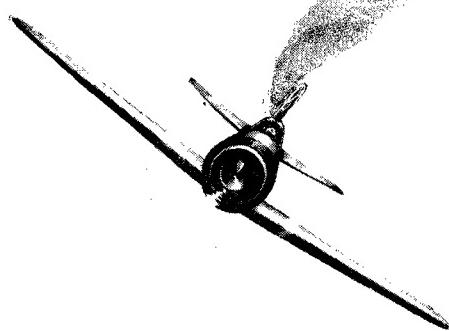
Certain German officers and men are reported to have been issued a special type revolver for use when taken prisoner. This weapon, built to fire 25 rounds, can be attached to a waist belt under the coat or tunic, with the barrel pointing outward. A wire connecting with the trigger runs inside the sleeve to the cuff. So armed, a German prisoner can hold his hands high over his head in surrender and still fire the gun at his captor. Feel good, if you like, about taking prisoners; just be sure they are not carrying hidden weapons.

☆ ☆ ☆

JAP PEP TALK. A Jap commander in the South Pacific felt called upon to address his troops in this manner:

"Endeavor to forget unpleasant incidents and to remember only the good. It is useless to brood over matters as an hysterical woman does. We are all thin from lack of food, but we must not show a haggard countenance when we get on the vessels. There is a saying that 'the Samurai displays a toothpick even when

he hasn't eaten.' This is an example worth emulating at the present time. Since we have been here, there have been those among us who have worked well and also those who have been lazy. The men of the 'suicide squads' and those with similar aspirations are among the bravest of the brave; on the other hand, those who have neglected their duty can only be considered despicable. Every individual must aspire to be a hero."



PLAYING DEAD. Enemy pilots have been known to simulate loss of control when our attacking fighters come within range and release long plumes of black smoke to give the impression that they have been hit and are out of action. At times the ruse has been employed to allay our attack and lure our aircraft into the range of other enemy planes.

☆ ☆ ☆

A DREAM COME TRUE. Nine weeks before Pearl Harbor, a Japanese soldier scribbled this note in his diary:

"September 29, 1941. Received a red letter (summons to the colors). . . . The inspiring dream of the coming war between Japan and America during my boyhood days is now a reality."

☆ ☆ ☆

THE GERMANS LIKE STRAGGLERS. "German airmen plan well and fight hard," reports Capt. Robert K. Morgan, bomber pilot veteran of 25 missions over Europe. "They don't go in much for heroics but they're cold-blooded in their estimates of results. They don't take unnecessary chances or over-match themselves if they can help it. But the Germans go after



'stragglers' every chance they get and are constantly thinking up new tactics and forms of attack to cause straggling."

☆ ☆ ☆

JAPS FAKE A DOGFIGHT. In the air, as on the ground, things aren't always what they seem. An American fighter pilot found that out not long ago during an air battle in the Southwest Pacific. This pilot was without an opponent for the moment, and the other men in his squadron appeared to be taking care of the situation. Squinting into the sun, he spotted a dogfight in progress about 2,000 feet above him. The pilot decided to climb up and help his buddy. He discovered, just in the nick of time, that the dogfight was a sham battle being staged by two Jap pilots. They were hoping to lure up a lone American plane—and almost did.

☆ ☆ ☆

"A TYPICAL NAZI BULLY." A German fighter pilot shot down in North Africa was interviewed by an AAF Intelligence officer who closed his report with these remarks:

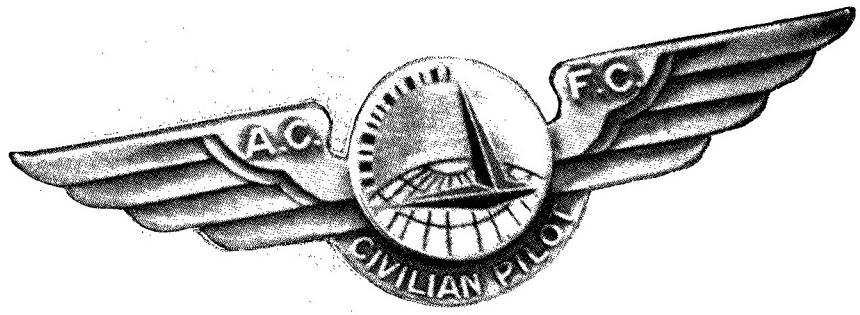
"—— is a typical Nazi bully. He is full of Nazi slogans without knowing what they mean. He has a guilty conscience about his activities in France and is afraid of what the French authorities will do to him. His morale is consequently low. He appears to be a habitual and not very clever liar and his statements should be treated with reserve."

☆ ☆ ☆

MAKE-BELIEVE ISLAND. The enemy goes all the way to achieve deception. Recall the "floating island" that turned up in the waters south of the Bismarck Archipelago near New Britain.

Our airmen became suspicious and went down to investigate. They found, not an island at all, but a large transport which the Japs had cleverly covered with palm trees and other tropical foliage in an effort to escape detection in the island-studded area.

Alertness paid dividends, however, and the transport was knocked out with direct hits. The inflammable camouflage quickened the end of the Jap vessel. ☆



OUR WOMEN PILOTS

By CHARLOTTE KNIGHT

Mrs. Betty Gillies was the first woman to fly a P-47 to an Army airfield.

AT an east coast airfield a P-47 roars in for a perfect landing. The pilot steps out of the cockpit of the Army's most powerful single-engine fighter and calls a greeting to the crew chief.

A few yards away an Air Force captain who had casually watched the ship come in does a hasty double-take. He turns to a fellow officer: "Good Lord, do you see what I see? The pilot! It's a girl—and that's a P-47!"

A C-47 in full war paint sits at a California base, warmed up and ready for ferrying to the middle west. Two girls in flying gear step up to the crew chief. "All set? Let's get going."

"OK," he replies good naturedly, giving them the once-over and wondering if someone has kidded them into thinking they could go along for the ride. "I'm just waiting for the pilots."

"We are the pilots."

In a few minutes the stupefied crew chief is watching the big twin-engined transport gain the skies in a smooth take-off with the girls at the controls.

IN the control tower of an Army airfield in Texas there's a puzzled frown on the face of the operator. He'd swear that

was a woman's voice asking for landing instructions. He checks the pilot's name—N. H. Love—but that's no help. It simply couldn't be a woman pilot for the plane is a B-25. He turns to the operations officer. Together they watch the bomber roll in at 110 mph and come to a stop. They look carefully as the pilot steps out.

"Well, I'll be damned," says the control tower operator. "I was right."

Elsewhere, P-51s, P-39s, C-60s, C-78s, A-24s and seventeen different types of smaller ships are being ferried around the country by a handful of women pilots, all members of the Women's Auxiliary Ferrying Squadron and all working for the Ferrying Division of the Air Transport Command.

The WAFFS were expected to be flying A-20s, P-38s and P-40s by September.

The reception at no two fields is alike. Sometimes the girls are accepted without question into a fraternity that respects a good pilot regardless of sex, but often enough the atmosphere is considerably more chilly than it is upstairs. These rebuffs the girls have come to accept as part of the game. More often the reception is of the plain "I'll-be-damned" variety.

Whatever the reaction, the only thing

that matters is that the WAFFS' apprenticeship is over. Originally slated to ferry only training and liaison craft, they have now graduated to the big-league ships and can hold their own with the best of them.

The girls have been on the spot since the WAFFS was organized in September 1942. Their smooth, white necks have been stuck way out and they know it. They've had to work hard and quietly to prove to a lot of doubting Air Corps Thomases that they could do a man's job. They've endured everything from patronizingly raised eyebrows to forthright resentment, and they've held their silence. And now they're saying it with combat ships—and saying it with the blessings of the Army Air Forces.

This is no sensation-begging affair, nor are these girls interested in usurping man's prior rights in the skies. They are not out to compete with men, but they are concerned with doing a man-sized job and doing it well. Today, woman's place is where she is needed. And until this war is won, that place is in the cockpit of ships women can fly from factory to field and, by doing so, release men pilots for combat duty.

At the moment their numbers in the

WAFS may be small, but many more will come, and soon.

All these women pilots, with the exception of the first WAF squadron of 25, have been, and are now being trained by the AAF Training Command. When they graduate they are eligible for membership in the WAFS.

The two organizations, although working in close liaison, are independent set-ups. There has been some public confusion about the two groups and in some quarters it is not yet entirely clear just who does which jobs. Here it is: The Women's Flying Training Detachment, organized by Jacqueline Cochran, now Director of Women Pilots, AAF, is a part of the Training Command; it *trains* the girls at Avenger Field, Sweetwater, Texas. The Women's Auxiliary Ferrying Squadron, on the other hand, is an operating unit which takes these pilots and puts them to work. A part of the Air Transport Command, it is headed by Nancy Harkness Love, now executive for the WAFS on the staff of the commanding general, Ferrying Division, ATC Headquarters of the unit is in Cincinnati, Ohio.

To date, four classes of AAF-trained graduates have joined the WAFS. They undergo a short period of Ferrying Division transitional training and then begin checking out on the different types of ships they will be called on to ferry. As it now stands, a girl will be allowed to check out on *any* plane she is capable of flying. Chances are this won't mean the multi-engined class, for there are many ships just too difficult physically for the average woman to handle. Besides, they will be kept plenty busy with one and two-engined aircraft.

A pilot must make five deliveries of a particular plane before she can go on to the next ship in a graduated scale based, presumably, on the complexity of the air-

The domestic ferrying of combat planes has become an everyday job for the fair sex in the AAF.

craft. In the Long Beach sector, for instance, this scale begins with the PTs and BTs, then graduates to A-24s, P-51s, C-47s, C-60s, B-25s, A-20s and finally P-38s. This particular range may vary in different ferrying sectors.

The WAFS is split up at present into four ferrying squadrons, located at Wilmington, Dallas, Detroit and Long Beach. Members of the original group of 25 are stationed at each spot.

Neither the WAFS nor the WFTD is as yet a military organization, so both pilots and trainees are on civil service status. Pilots receive \$250 a month plus \$6 per diem on ferrying missions. They live in regular officers' barracks turned over to them for that purpose and enjoy all the privileges of officers.

THEY wear a standardized "attire" of their own consisting of a grey-green jacket, slacks or skirt, tan shirt and an overseas cap. On ferrying trips they may wear just shirt and slacks or GI cold weather flying suits, leather jackets and, of course, parachutes and head-sets.

They take no oxygen equipment since, like domestic ferry pilots of the opposite sex, they seldom fly above 12,000 feet on ferrying missions. Proud as they are of flying combat ships, they know quite well that merely ferrying a ship is one thing and putting it through its tactical paces is quite another. They are content to leave the acrobatics and the combat tactics to the men in the Air Force they serve. The girls merely "pick up a ship, fly her, set her down."

On return trips to their bases after delivering aircraft, the WAFS usually wear

their regulation jackets and skirts, and are forever being taken for airline stewardesses. They are a little tired of being asked in airports, waiting for commercial liners to leave, whether "lunch is served on Flight 2" or "How long do we stay in Albuquerque?" or "Can I get a plane out of Kansas City tonight?" If the answer is merely "I don't know," the passenger often goes away muttering under his breath about inefficiently run organizations and letters of complaint to the president.

Nearly all of the WAFS' waking hours are spent in uniform. Since they are always on call, they figure there is little percentage in wearing their civilian clothes. When one squadron first went to Dallas, they were there three weeks before anyone saw a single woman pilot out of uniform. One night there was a dance at the Officers' Club. The girls went all-out for the occasion and donned long, flowing evening dresses, fixed their hair into evening coiffures, pinned flowers on their shoulders and arrived at the party. It was ten minutes before anyone recognized them.

Women ferry pilots have little or no private life. They work between fifty and sixty hours a week, often longer. One girl spent only four nights on her home base in six weeks. B-4 bags packed at all times, they must be ready to go on a mission on an hour's notice—even less. When they'll get back to base is anybody's guess. In winter flights the chances of being grounded somewhere along the way are high. Last December one pilot, ferrying a PT-13, was weathered in for 21 days in a small mid-western town.

At other times the in-between stops provide their own drama. Last winter, four WAFS grounded in an Illinois town narrowly escaped injury when a violent explosion blew up a garage directly opposite their dining place. The same group

Last minute map check in the WAFS comfortable "alert room." Left to right: Gertrude Meserve, Nancy Batson, Terese James, Esther Nelson, Dorothy Fulton

and (kneeling) Betty Gillies, commander of the WAFS for the 2nd Ferrying Group, Wilmington, Delaware. Below, Evelyn Sharp brings in a C-47.



was trapped the following night in a hotel fire in Springfield, Mo., and escorted down ladders in the middle of the night. But the bad luck for the week was not over. The flight leader arrived at the field next morning to pick up her plane and was greeted with the announcement, "Oh, we're so sorry, miss. Somebody ran into your plane last night. It will take some time to get it repaired." And it did.

On base, you'll find the girls either in school or in the ready room. School is in continuous session at ferry bases. Pilots, when not flying, are expected to attend. It keeps their minds fresh on such subjects as meteorology, navigation, radio and new techniques in flying. They like it.

Wherever they are, their ears are always subconsciously listening for their own names to be read over the loud speaker system. Maybe it's 0600 o'clock, 1400, or perhaps they're in the middle of a coke in the Pilot's Loft.

"Clark . . . Richards . . . McGilvery . . . Miller . . . Schart."

Names are up. They report to Operations, collect maps and orders, return to their quarters, pick up the B-4s, draw their chutes, and they are on their way. Perhaps they go to a nearby aircraft plant by car or if it's a base some distance away, they may fly by Army transport. They arrive, pick up the aircraft to be ferried and take off. They fly no night missions, so unless they can complete the mission an hour before sundown, they land at a previously designated airport, check in at Operations, send an RON (remain overnight) to their headquarters, find a hotel and fall into bed.

Up at 0600 the following morning, they resume the flight. After their mission is accomplished, they collect their receipt forms, order a car to the commercial airport, present their Priority BB credentials for a reservation on the next plane—and wait. This is the worst part. They read, play solitaire, kill time in the airport restaurant, wander around restlessly. Finally they are on the plane and headed for home. Maybe they get back to base at midnight, but "woman's work is never done." There are shirts to wash and iron. There are clothes to clean and press, for clothes must be kept spotless. This may take until 0300 o'clock. Bed, breakfast, school. By noon, perhaps they have new orders and are off again.

Sometimes getting back is not so easy. Once they've delivered their aircraft the pilots are at the mercy of the public carriers. And many fields are hundreds of miles from the commercial airways. Not infrequently that means trains, or worse, buses—buses jammed with war-time travelers. Often they have to stand for 200 miles or more to get to a commercial airline.

There are times when sleeping quarters present their own problems. Several

WAFS, ferrying Cubs, once had to land at the Marine Base at Quantico, Va. Anxious to provide true Virginia hospitality, the Marines took part of the VOQ, partitioned it off with a sort of "wall of Jericho," and posted a sign "Keep Out! Ladies Present." This time, the ladies had the situation well in hand.

Nor are these women pilots immune from the flying episodes that keep ferrying from being humdrum. You'll hear about the time six WAFS flew some PTs from Great Falls to Billings, Mont. Twenty minutes out, the flight leader noticed all five of the flyers below circling without apparent reason. There were no radios in the ships by which she could ask the score. She flew down, straightened them out. Within a few minutes the five planes started circling again.

AGAIN the flight leader came down. Again they straightened their course. And again they circled. This routine kept up until a distraught flight leader located the first alternate airfield she could find on the course and signalled for the girls to land—a tricky business because of icy runways, high snowbanks and too little room. The leader landed, crossed her fingers and prayed. The girls came down safely, rushed up to one another and all started shouting at once.

"Look," said the girl who had been designated navigator of the flight, "I lost my maps, all of them, twenty minutes out. I kept circling to let you know something was wrong and to let someone else take the lead. And of course everytime I circled, all the other planes followed in."

Nancy Harkness Love, head of the WAFS.



structions and circled after me. Couldn't you tell I must be off course?"

But it developed she had been *on course* all the way, which is the reason the flight leader couldn't imagine what was wrong. With nothing but a watch and a compass, the girl had done quite a job of navigating.

There are no days off in the ferrying business. The girls would not take them if there were. They would much rather stay on base than take a chance of missing a flying assignment. Like the men, they would rather fly than eat.

Although many of the original group of WAFS are young in years, all of them were seasoned pilots long before they took these jobs. Original requirements called for 500 hours flying time, but the average for each of the girls in the first group of 25 members was 1,162 hours.

Mrs. Love has spent the last thirteen years flying. Before the war she was the first woman to ferry planes to the Canadian border, where they were towed across the line in compliance with the Neutrality Act. With her husband—now Colonel Robert Love, deputy chief of staff for the Air Transport Command—she initiated many flying clubs in colleges. A year before the organization of the WAFS, Mrs. Love worked with the ATC. She mapped ferry flights and learned command procedures and routes.

The first pilot to qualify for the WAFS was Mrs. Betty Gillies of Syosset, Long Island. She had 1,400 flying hours when she joined the organization, holds almost every kind of rating, was for two years president of the "99," an international club of women flyers formed by Amelia Earhart. At present she is squadron leader of the WAFS in the 2nd Ferrying Group, Wilmington, Del.

ALMOST without exception, the girls composing the original WAF squadron were professional flyers before the war. Some were instructors; several ran airports. Mrs. Lenore McElroy, executive officer of the Romulus (Mich.) group, had 2,500 flying hours and eight years as an instructor when she came into the WAFS. Evelyn Sharp, with 2,950 hours, taught flying in California. Nancy Batson came to the WAFS direct from Embry-Riddle Flying School in Miami where she was an instructor. Mrs. Esther Nelson operated a flying school in Ontario, Calif. Dorothy Fulton, who had flown 2,500 hours, ran her own airport in New Jersey.

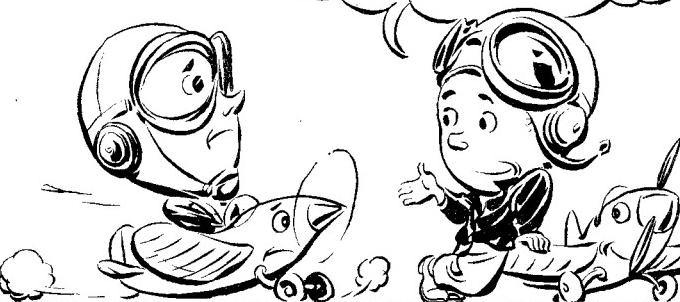
Bound together by mutual interest in flying and in releasing male flyers for combat, these girls, all of them under 35, have put homes and families behind them until the war is won. Many are married and several have children. Almost all have relatives or sweethearts in the Air Forces who, they would like to think, are as proud of the job the girls are doing as the WAFS are of their fighting brothers. *

WHY "SAY AGAIN"?

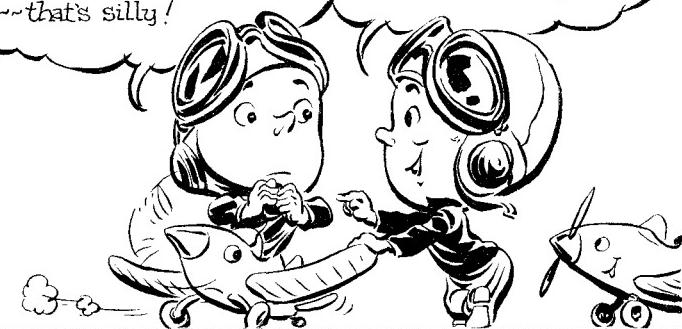
I don't get it--why use "Say again" when we've been using "Repeat" for so long?

Look, Jo--in England, the word "Repeat" on the radio means: "Fire that last salvo again at the same range"--you wouldn't want that to happen every time you wanted a message repeated, wouldja?

That's where you're wrong! A plane radio message may be confused with a firing order--communications will get all balled up if one word means two different things!



Now wait, Al,--you know they're not gonna be firing a salvo every time a pilot says "Repeat"--that's silly!

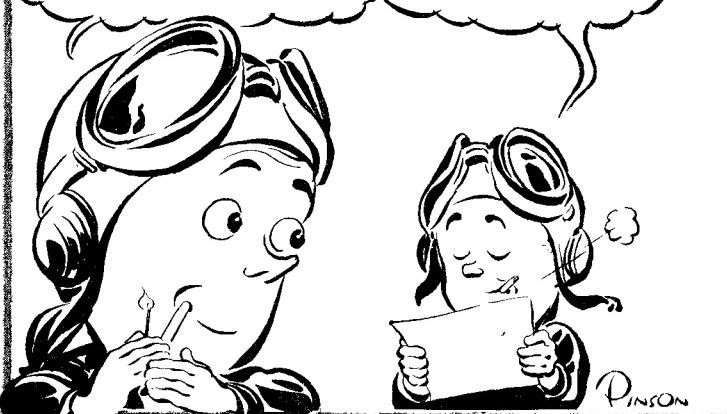
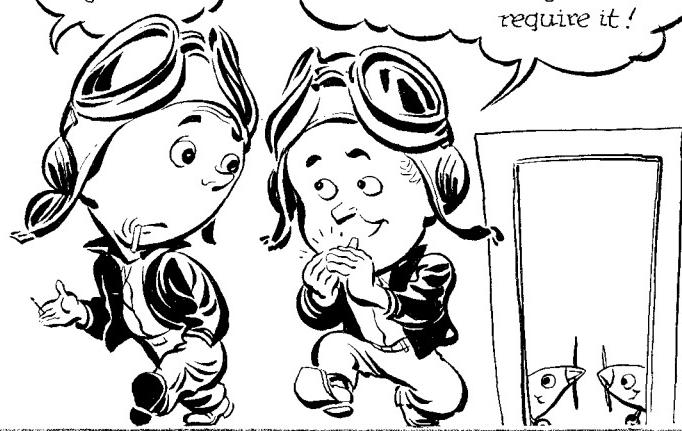


Sounds convincing, but I hate to learn th' language all over again, Al!

It ain't that hard--you can learn all the changes in a few minutes. The British are doin' it--and regulations require it!

Okeh--"cooperative Jo," they called me in Miami! Wherell I find a list of approved words?

Right under yer elbows--lean over an' take a look !!



PINSON

VOCABULARY

Approved Words

OVER

OUT

ACKNOWLEDGE

WAIT

SAY AGAIN
I SAY AGAIN
HOW DO YOU HEAR ME?

Meaning

My transmission is ended and I expect a response from you.

This conversation is ended and no response is expected.

Let me know that you have received and understood this message.

I must pause for a few seconds. If the pause is to be longer than a few seconds, "Wait out" should be used.

Repeat.

I will repeat.

Can you hear me?

Approved Words

CORRECTION

WRONG

THIS IS

ROGER

WILCO

Meaning

An error has been made in this transmission. The correct version is . . .

What you have just said is incorrect. The correct version is . . .

Instead of the term "from." Example: "Central Tower--this is Army 1234" or "Army 1234--this is Central Tower."

I have received all of your last transmission.

Your last message (or message indicated) received, understood and (where applicable) will be complied with.

AIRDROME CONSTRUCTION IN NORTH AFRICA



Filling bomb crater on North African airfield.

By Brig. Gen. D. A. Davison

CHIEF ENGINEER, NORTHWEST AFRICAN AIR FORCES.

PROGRESS of aerial operations on any front depends to a great extent on the speed and efficiency of airdrome construction. This is an obvious fact not generally appreciated. As Maj. Gen. Eugene Reybold, Chief of Army Engineers, has pointed out:

"A key to air power, the engineers now lay down in a few days airfields which a few years ago would have taken months. Engineers are still the Army pioneers."

Nowhere has this been better demonstrated than in North Africa.

When U. S. forces first landed on that coast, there were only nine airdromes in condition for use by our bombers, fighter planes and transports. There are now more than a hundred fields in the same territory. Had it not been for ample supplies of heavy equipment and the skill of our aviation engineers, the victory in Tunisia might have been long delayed.

From the beginning, manpower represented one of our major problems in North Africa. We had several battalions of aviation engineers. In view of the size of the job to be done and the elements confronting us, this was not enough, and the strength was later doubled.

We were well equipped, however. Each unit of aviation engineers had heavy earth-moving equipment, rock crushers and a fairly good supply of dump trucks, so we were prepared for construction jobs requiring the movement of a considerable quantity of earth.

This equipment is no different, piece for piece, than that which you would see on any large road-building job or other sizeable construction project in the United States. But it is vastly superior to anything possessed by the British units and probably by the enemy.

For some time after we landed, the shortage of such equipment created a

bottleneck, but this was eventually rectified. Today in North Africa there's enough heavy-duty equipment to handle almost any demand placed on our units.

Mud was our chief antagonist in Africa. Our airdromes were built during an unusually long winter and a very wet spring. We overcame the mud in the only way possible—by prodigious labor.

Our battle with African mud began as soon as we landed, when an effort was being made to pull our units forward from the bases on the west coast.

Initially, we were able to concentrate our air strength around Casablanca and as far forward as the Oran area, occupying principally the airdrome named Tafaraoui. But to any engineer from North Africa the word "Tafaraoui" doesn't mean an airport. It means a malignant

The role played by aviation engineers in the North African victory is a pattern for future offensive operations.

quality of mud—something like liquid reinforced concrete of bottomless depth. We still speak of any particularly bad type of mud as "Tafaraoui." At Tafaraoui there were two partially completed hard-surfaced runways when we took it on November 10, 1942.

La Senya, now used as a depot, wasn't available to us at first because it had no runways, and they were quite essential as we were just getting into the wet season. When the fighting ships numbered several squadrons, we still had only Tafaraoui from which to operate them.

I remember a night in November when many fighting ships were on this airfield, and most of them were mud-bound because they couldn't reach the hard-

surfaced runways from the dispersal points. Something had to be done quickly so we could get out of there. Some of the ships were flown forward to Maison Blanche, at Algiers, which was hardly better from the mud point of view, but this move gave us two fields from which to operate. Maison Blanche had part of one hard-surfaced runway at the time.

Congestion was equally shared between Tafaraoui and Maison Blanche, the only difference being that we tried to operate the B-25s, B-26s and P-38s from Maison Blanche, holding the B-17s and their fighter cover back at Tafaraoui. It was necessary to fly an additional 160 miles from Tafaraoui, but there were no other airdromes. At Maison Blanche, also, we suffered from congestion because of lack of any opportunity to disperse. It was clear that we had to expand again.

Our problem seemed to be a simple one. That is, it could be analyzed simply. We needed more airdromes, dry airdromes, and some place we could disperse the planes. We knew that a drier terrain could be found in the central plateau than along the coast. So we went up into the Telergma area. There we found a small postage stamp field, but nothing from which we could operate B-26s. And it was the B-26s that General Doolittle wanted to get up forward to take advantage of the shorter range. Telergma was considered quite well forward in those days.

From December 2 until December 7 a group of aviation engineers, with some French troops and Arabs, made a field out of Telergma from which we could operate the mediums, and that field has hardly lost a day's operations since we opened it on December 7, 1942. Today, the Telergma area has been expanded until it contains ten airdromes—all of

them suitable for the operation of heavy bombardment planes. Most of the fields share some of their hard standings with their fighter cover. Two pairs of fields are so situated that they give P-38 escorts a satellite field to themselves.

The Telergma fields served to bring the mediums quite far forward and helped solve the problem of dispersal.

Next, we heard about an extensive plateau which had been used as an airport at the desert oasis of Biskra, which is well through the Sahara Atlas range and down into the Sahara Desert, where it is really dry. We flew down to Biskra and discovered that there was a field which could be expanded. General Doolittle was so anxious to open up Biskra as a new base for his B-17s, and thus get some of them out of Tafaraoui, that we made our first use of airborne companies of aviation engineers, two of which we had landed and were holding back at Port Lyautey, nearly 1,000 miles away.

We sent troop carrier C-47s back after them and their equipment and flew them to Biskra. Twenty-four hours after their arrival we had the first B-17s come in from Tafaraoui. After the shift of the base up to Biskra, it was never necessary to go back to Tafaraoui with the B-17s because before the dry season broke for the Sahara, as it did about March 15, we had already converted the Telergma area for heavies. We pushed the mediums on forward, and the heavies went from Biskra into the Telergma area. That about summarizes the struggle we had in the early part of the campaign.

Then came the task of kicking the Axis forces entirely out of Tunisia. We began to prepare our airdrome program for this second phase of operations.

From an engineering point of view, the problem presented by the needs of the Tactical Air Force was most interesting. Its airdrome story can be told in terms of two specific units—the British RAF 242 Group, under Air Commodore Cross, and the 12th Air Support Command, under Brig. Gen. P. L. Williams.

The 242 Group started out with a single airdrome at Souk El Khemis and finally developed this into a group of eleven airdromes. All are built for fight-

ers. That is, the airdromes are approximately 4,500 feet long and from 200 to 600 feet wide. They are distinctively named after London's railway stations; Euston, Victoria, Charing Cross and so on.

General Williams' Air Support Command came into the picture when the American Second Corps first fought with the British under General Lloyd Fredendall in the Tebessa, Thelepte, Kasserine and Sbeitla areas.

THE initial successes of the Second Corps permitted us to put an airdrome at Gafsa. It became General Williams' job to cover the south flank of the fighting forces right up until the time they were pinched out, or pushed forward, by the Desert Air Force. For instance, when the Second Corps was withdrawn from south of the First Army it was moved around to the north where, under the command of General Bradley, it later distinguished itself so magnificently in

"THE BEST EVIDENCE"

This story of the aviation engineers in Northwest Africa is the best evidence yet presented on rapid airdrome construction for a large air force in a new theatre. When I visited this theatre last December, the obstacles of mud, rainy weather, shortage of equipment and difficulty of supply were handicapping the untiring efforts of our engineer troops. But more men and especially more heavy equipment kept coming, and the difficulties were overcome. As General Spaatz said in commanding his aviation engineers, they "never failed to accomplish their objectives in time."

The aviation engineer component of the Army Air Forces now numbers over 100 battalions, many of which are overseas. This story of achievement will be a particularly helpful and stimulating one to the units still in training at home. It also presents strong justification for the special type of engineer unit and training that has been developed for the Army Air Forces. General Davison had assisted in this development as commanding officer of the 21st Engineer Aviation Regiment in 1940 and later as Engineer of the G.H.Q. Air Force. He thus brought to his task with the Northwest African Air Force an understanding of their needs that helped build the fine teamwork described herein.

S. C. GODFREY
Brigadier General, U.S.A.,
Air Engineer

A surveyor and grading machines work simultaneously on a new airbase site.



the Battle of Tunisia. We increased the number of fields for the 242 Group, particularly up along the coast.

Some of the fields we made never had an airplane land on them for the simple reason that the final break-through came so quickly that additional fields in this rear area were no longer necessary. We were able to make use of fields in Tunisia which had been held by the enemy.

From an engineer's point of view, the key word for the Tactical Air Force was "speed." They needed their fields in a hurry. In the case of the Air Support Command, we found that General Williams' minimum requirements called for the construction of several fighter fields. These we built in a succession of groups as his command moved forward.

At the beginning of the campaign, long before the February reverses in the vicinity of the Kasserine Pass, we had constructed several fields in the Thelepte area. All of those fields had to be abandoned at the time the Germans pushed in through the Kasserine Pass and reached the ridge east of Tebessa. We did abandon Tebessa and Youks Le Bain, pulling back into a group of fields to the west, but, actually, we didn't have to sacrifice even the supplies left behind. The Germans never got through to these fields for we were back again in the Thelepte area almost as soon as the Germans were out of the pass.

While in the Thelepte area we received word that General Williams wanted fields built in the Sbeitla sector. Seventy-two hours after he made his request we had completed the reconnaissance and constructed all of them. This reflects much credit on the officers and men who actually did the work. It is a fact worth repeating that in three days General Williams actually moved into these fields, none of which existed 72 hours before.

In building this group of fields I recall that one company which constructed the most easterly of them moved out in front of the outpost of the First Armored Division. The first night, when in checking up on the location of the companies I went through the lines of this Division, they stopped me and asked if I knew I was going out in front of their patrols.

The same field three days later is completed and ready for aircraft operations.

I said I was looking for a certain engineer company and asked if it were out in front. They replied, "Yes, if you mean those damn fools who didn't pay any attention to us and took those big machines out. We think they are about ten or fifteen miles down the road." I found this company dug in with its defense weapons in place, already at work, and fully aware that they were in no-man's land.

General Williams told me he would trust that group of engineers to go anywhere for him and build any set of fields. He said that just as soon as he was told those fields were ready for occupation he would move his units up without even making an inspection because he was confident this engineer unit knew his needs and would supply them.

From Sbeitla we made a considerable jump forward. General Williams stayed in the Sbeitla group until the Eighth Army Desert Air Force was pretty well along. The Eighth Army had broken the Mareth Line by this time and moved in north and west of Gabes. General Williams' next jump was to the LeSers area.

Here we built six fields. The British airdrome construction units came down and helped us, so it was a combination of American and British manpower with American heavy equipment which finally finished the six fields in the LeSers sector. I remember being at one of the fields (called LeSers 3) about 1930 or 2000 o'clock one Sunday night. There were four blade graders working in tandem, slowly trimming the field into final shape. A convoy of two-and-a-half-ton trucks, driven by big, husky colored troops, was bringing in gasoline—tons and tons of gasoline. General Williams' scouts, using jeeps by the scores, were coming in, and the signal trucks were arriving. We finished the field that night. At dawn one of his groups of P-40s moved in and settled down.

The 242 Group and General Williams continued to fight here until after we were able to move forward to former German fields in the vicinity of Tunis and Bizerte. We had anticipated a great deal of difficulty with those Tunisian fields because of the thoroughness with which the Germans mined certain areas. There was very little to worry about, however, because the break came so rapidly that the Germans had no time to mine them.

However, in one runway of the group of fields between Bou Arada and Pont du Fahs we took out 1,788 anti-tank mines. That sounds as if it were a hazardous undertaking, but it was not. We used a technique for de-mining an area which the aviation engineer's had developed in their school. When we discovered there were mines in a locality—which we could do by putting men out at intervals of fifty feet and moving forward each with one of our excellent mine detectors—we would close into that area. Having



Unloading a bulldozer from a transport.

determined the pattern, if one existed, and where the individual mines were, we would then send two men forward. One would creep on his hands and knees and very gingerly scrape away the earth—usually eight to nine inches.

This first man would uncover the mine and neutralize it. That, however, didn't necessarily make the mine safe for it might have been booby-trapped with another exploder screwed in on the side or the bottom. If such were the case, the mine would be anchored into the ground. If you lift or try to move a booby-trapped mine you set it off—even though the central fuse has been taken out. So the task of the first two men was simply to uncover the mine and carefully feel around it to see whether it was booby-trapped.

Next, two more men would come up and explode the mine. By lying flat on the ground we were in little danger of being hit. In fact, we never had a casualty while de-mining a field. It took us about eight hours to take up these 1,788 mines—not a particularly hazardous or long, drawn-out task.

If we had been forced to apply that technique to each one of the fields in Tunisia, however, it would have been quicker to build new fields. As a matter of fact, we had selected the sites and were prepared for the construction job.

The 242 Group later moved forward from its fighting positions and General Williams' Air Support Command moved out from the LeSers group. We built seven or eight airdromes at the new positions, including one on the beach of a dry lake. Those were not captured German bases. They were all new.

The problem of General Doolittle's Strategic Air Force was very much different from that of the Tactical Air Force and, from an engineer's point of view, much simpler. He wanted airdromes from which mediums, as well as heavies, could

carry offensive blows to the enemy. His targets were Sicily, Sardinia, Italy and Tunisian ports of Sousse, Sfax and Gabes.

The principal bottleneck of the Strategic Air Force was not so much airdromes as supply. I have described how they finally worked from Tafaraoui up to Maison Blanche and then to Biskra.

We knew from the meteorological reports that weather was good at Biskra until March 15—the beginning of the high southerly wind coming up across the Sahara, which literally covers everything with sand. We planned to get out of Biskra about March 10. We did it by moving the heavies into the Telergma group where we already had ten airdromes. There was very little work to do, since a field that will accommodate a B-25 or B-26 will very easily take a B-17.

The problem was to get new grounds for the mediums which had been occupying this Telergma group. We moved the mediums forward to the Montesqueu area where there were five fields—two near Sedrata in the west and two at Ouenza in the east—a group of fields that nicely accommodated these planes. One of the Ouenza fields is as nearly an unlimited field as I have ever seen. We just arbitrarily decided where to stop. It was three miles long, all as flat as a billiard table. That flatness is characteristic of the plateau land between the Maritime Atlas and the Sahara Atlas ranges.

The heavies, having once moved to the Telergma area, remained in operation there continuously throughout the campaign and are still using those bases.

Just as "speed" represented the key word for the Tactical Air Force, and "supply" the key word for the Strategic Air Force, the term "permanent construction" is characteristic of the problems we had with the Coastal Command. This command was charged with convoy cover and antisubmarine activities.

Coastal airdromes (Continued on page 21)

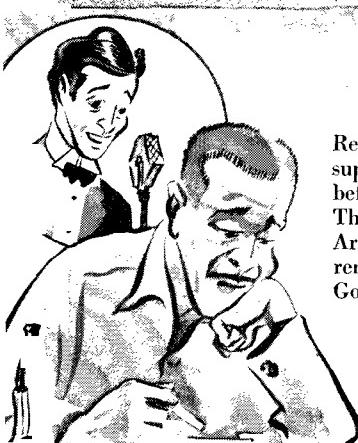
Godfrey Stuyvesant Giltedge III has just been made a corporal and is bent on overwhelming the local smart set during off-duty hours in a suit of tropicals with shoulder straps and oversize chevrons. It's "no sale" for the clerk, however, who notes Godfrey excerpts from AR 600-35.



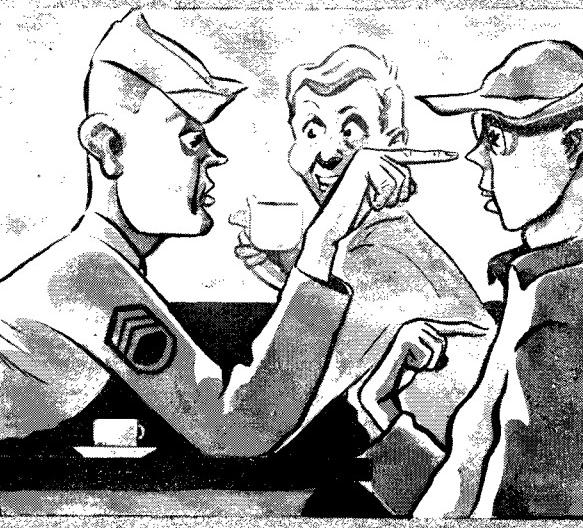
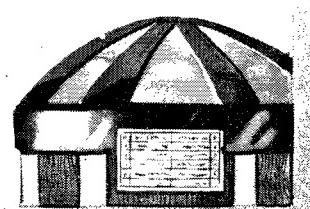
AAF EXCHANGE (DOMESTIC)

by Lieutenant William T. Lent

Recruit Tucker used to sing for his supper over the national networks before his draft number came up. This morning he suffered his first Army haircut and at the moment is reminiscing to the tune of "As Time Goes By" via the tired old juke box.

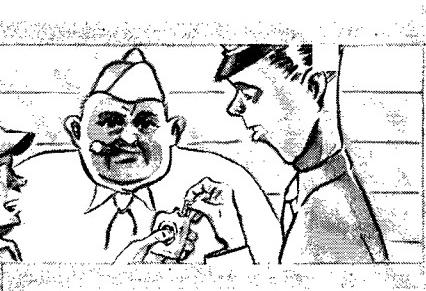


He mooch. Three dollars I bring you five on pay-y. He must get his uniforms from the cleaners for turday's personnel inspection. He'll probably repay me three and forget the two paydays, but borrow ten next day. What a system.



With the advent of the WAAC there came a rebirth of GI chivalry. Nowadays even dyspeptic top-kicks catch themselves smiling occasionally. Here First Sergeant Stone graciously assists a cute little auxiliary with her breakfast tray. Time was when a person speaking to the Sergeant before he had sipped his morning coffee was a cinch to pull a week's latrine duty.

The Army has done wonders for the "plain girl." What with the competition and four to six weeks isolation in recruit camp, many a soldier begins to see the beauty hidden in Winnie the Waitress. Winnie has her points, at that.



PX-ograms are almost as pernicious as latrine-ograms and certainly no more reliable. Staff Sergeant Bellows has it straight from the surgeon's office that all permanent party men soon will be given staphylococcus inoculations preparatory to shipping to Zanzibar.

PREPARE FOR INSPECTION



TIMELY ADVICE FROM THE AIR INSPECTOR

Matters presented here are informative only, and are not to be considered as directives.

THE need has been felt for a medium to disseminate Army Air Forces inspection information to the field, and a section of this publication will be devoted monthly to serving that purpose. Helpful suggestions and improved methods of doing the job will be included. It is intended that the information will be beneficial not only to the inspector, but also to the man being inspected.

Inspection concerns every man in the Army Air Forces, from the private who pours gasoline into a plane to the general who ordered its flight. The man in uniform is either an inspector or an inspectee. The inspector is not immune to inspection, for on occasion he himself becomes the inspectee.

The purpose of inspection, as stated in AAF Memorandum 120-6, "is to insure the highest possible efficiency of all components of the Army Air Forces and to determine the degree of their efficiency at frequent intervals. . . . It must cover every individual, every activity, and every item of supply and equipment."

Inspection reaches down to check whether corrections in the sick book have been initiated or whether technical orders have been properly filed, but the main mission—fitness for battle—should, like Pearl Harbor, always be remembered.

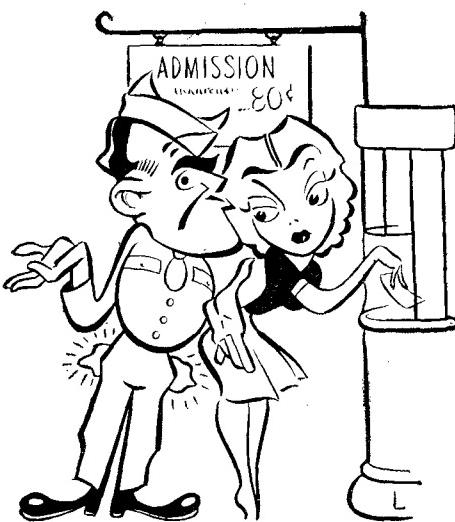
The underlying principle of the AAF inspection system is decentralization to lower com-

manders and supervision by their next higher commanders. Inspection is not primarily a "dress parade" affair, but a work-day proposition.

In the job of getting ready for battle, organizations and individuals are inspected along the line by representatives of their own and higher commands. Then, when they reach the staging area, they are met by a "POM" (Preparation for Overseas Movement) team of inspectors from the Office of The Air Inspector, Headquarters AAF. This team is composed of technical, tactical, administrative and communication experts. They want the answer, from first hand observation, to the question, "Are you ready?"

To help answer that question with a strong affirmative, The Air Inspector will provide on these pages tips to inspectors and inspectees, activities requiring inspection emphasis, and pertinent changes in regulations and directives, with a question and answer section. Ideas and information from the field are welcome. AAF Memorandum 120-6 authorizes direct communication between station, group, and higher commanders and The Air Inspector on matters pertaining to inspection.

JUNIUS W. JONES,
Brig. General, U. S. Army,
The Air Inspector.



Get Him Paid

Seeing that you are paid promptly, soldier, and avoiding embarrassing moments is a major interest of many persons in the Army Air Forces, including the Commanding General himself. Payment of troops is a function of command which receives the personal attention of all commanding officers. They are responsible for submitting to disbursing officers regular or supplemental pay rolls or individual pay vouchers. These should cover all enlisted men either permanently or temporarily under their command who are entitled to pay, so that payment may be made at least once a month (WD Circ. 114, 1943). Inspectors check frequently to see that pay is not delayed. Your job, soldier, is to have your Form 28 (Individual Pay Record) with you at all times. You are not in uniform without it. You should know when entries are to be made in it and how you can get paid on it. If you don't know, look up a letter addressed to you on the subject from AAF Headquarters (February 13, 1943). It should be on your bulletin board.

Service Record Trouble

Overseas

An inspector general in the Africa-Middle East Wing points out in an action letter that many service records had not been indorsed before they left the United States. Was your station one of those which overlooked this?

Plane Facts Worth Noting

Notes from the scratch pad of a technical field inspector after making his rounds inspecting aircraft:

Fuel line clamp loose on line from wobble pump to carburetor . . . Oil separator screen plug clogged up . . . Small quantity of kerosene in magneto breaker assembly . . . Bad hose on fuel line between wobble pump and carburetor . . . Hose in need of replacement at C-2A strainer . . . Disconnected oil breather line at engine . . . Dirty filter in fuel

analysis cell . . . Rubber battery overflow line in need of replacement . . . Indication of oil leak at oil drain fitting . . . Wheel cowling top bolt loose . . . Landing light reflectors in need of cleaning . . . Hydraulic reservoir filler cap frozertight . . . Flap universal joints in need of cleaning and oiling . . . Bolt missing from throttle quadrant . . . Airspeed indicator light out . . . Front cockpit emergency exit handle not safetied . . . Fire extinguisher in need of refilling . . . Sheared unit on spark plug cooler, No. 4 cylinder . . . Upper rear engine plug not safetied . . . Baffle plate nuts loose, No. 2 and 3 cylinders . . . Left wing spar cracked at inboard end . . . Control cables in tail section dirty . . . Left wing walk needs replacing . . . Cracked braces on wheel wells . . . Bolts loose and rubber worn on baggage compartment door . . . Mooring kit incomplete . . . Engine gauge light inoperative . . . Cockpit light reflector missing. How many of these points apply to your plane?

Efficiency Ratings for Officers

Are you commanding officers evaluating the efficiency of officers in comparison with that of other officers of similar grade? In a tactical group inspected, all officers of one squadron were rated "superior" on their Forms 66-1, and all officers of another squadron "satisfactory." The ratings were obviously worthless. We would like to think—and have the Axis think—that all the officers of a squadron are superior, but this is not the case. Likewise, all the officers do not normally fall into the satisfactory class. Ratings are particularly important overseas where there is frequent shifting of personnel.

Radio Code for Victory

"Yes, I could take code at about twenty words a minute when I finished radio school, but now I'm pretty rusty. I've even forgotten the alphabet."

Hamlet's soliloquy has no sadder words than these. Yet squadron commanders overseas, desperately in need of a radio man for a bombing mission, are familiar with them.

Unit commanders should see that classification cards are checked frequently to be sure that all their radio men are receiving code practice, whether on real or simulated equipment. (A newly activated squadron at a Nebraska base used oscillator tubes and speakers from old radio sets for code practice before receiving its regular equipment.) In training flights, numerous special messages should be transmitted between ground and flight operators to augment routine reporting of position. You yourself, soldier, should have the initiative to keep off that rusty list.

Right Tube at Right Time

Most airborne radio operators know that there is a kit of spare radio parts, such as fuses, tubes and dynamotor brushes, stowed in the airplane. But how many check the contents of this kit periodically to be sure that all necessary parts are present, and how many do enough "tinkering" to be able to spot trouble and make necessary replacements? The ability to replace the right tube at the right time may some day mean the difference between getting home for supper and eating emergency rations in a dinghy.

Plenty of Marksmanship Badges

An enlisted man wants all that is coming to him, and that includes his marksmanship badge. Many men have not had the opportunity to see how their badges would show up under a South Sea sun because

the United States base at which they fired their course had no badges. Word from the Philadelphia Quartermaster Depot is that there are plenty of badges and bars there, and base quartermasters and supply officers are advised to forward requisitions to the depot. (AGO Memo. S600-11-43). *Prepare for inspection* with a supply of badges.

Wastage of Food

Conserving food doesn't mean we must lose our reputation for being the "best fed army in the world." It means that you mess officers and sergeants in the field—in Tunisia or Texas—must check the waste going into garbage cans.

Wastage can often be traced to the fact that mess officers are not getting accurate reports on the number of men to be served. Men are transferred out, and the mess officer is sometimes the last one to be informed. This is particularly true in large consolidated messes.

Also to be checked is whether there is

prompt delivery of perishables to bases. At one midwestern base, meats were delivered in a spoiled condition. An inspection revealed that the meats were sitting out on a depot platform for long periods because a local trucking concern which had the delivery contract did not have enough trucks to handle the shipments promptly. The quartermaster then made arrangements to pick up the meats in government vehicles.

Mail Must Go Through

Mail clerks, where do you deliver the letters for the men of your squadron? If you are delivering them on bunks you are doing an injustice to your buddies. Letters (some with money from home, and you know how important these are) become lost through delivery on bunks.

Note to mail clerks in tactical units: Have you seen a copy of FM 12-105? It tells you how to *prepare for inspection* in the handling of mail overseas.

HERE ARE THE ANSWERS

Q. Where can details be found on the requirements for service and liaison pilots?

A. Detailed requirements are outlined in AAF Regulation 50-7, February 5, 1943.



Q. WD Circ. 303, 1942, directs that commanding officers will not require special creasing of shirts by laundries and cleaners. Can a man's wife crease his shirts at home?

A. No. Wearing shirts, the fronts or backs of which have been specially creased, is forbidden. (WD Circ. 122, 1943)



Q. Does an officer on limited service have a chance to go overseas?

A. Yes. Provisions are outlined in WD Circ. 86, 1943.



Q. Can an enlisted man in an attached service apply for transfer to another unit in the Army Air Forces for which he is especially qualified by civilian training?

A. Yes. Under no circumstances will a man possessing scientific, professional or technical skills of which there is an acute shortage in the Army be continued in an assignment which does not make full use of these abilities. (Change 3, AR 615-28). However an enlisted man will be transferred only for the convenience of the government. Transfers will not be made solely for the convenience of the enlisted man or his family (War Dept. Cir. 308, 1942).

Q. Can an enlisted man be sent back to the United States from overseas for aviation cadet training?

A. Yes. He may apply for such training through normal channels if he is between the ages of 18 and 26 inclusive and is physically qualified. (Note: Men overseas can also apply for officer candidate training.)



Q. Is there a standard WD form for maintaining a record of an officer's accrued leave?

A. No. WD Circ. 55, 1943, provides that "for the duration of the present war and six months immediately thereafter, personal certificates of officers attesting to the amount of their accrued leave will be accepted for all purposes without other supporting evidence." However, to have available the necessary information, officers should keep copies of their orders granting leave.



Q. Can the produce from victory gardens on bases be sold in town?

A. No. Food so produced will be for the consumption of military personnel only and not for sale to civilians. (WD Circ. 83, 1943.)



Q. Can an enlisted man still deposit surplus funds with any disbursing officer?

A. Yes. He will receive four percent interest on all deposits. AR 35-2600.

INSPECTING THE INSPECTOR

How much of your time are you devoting to actual inspections in the field? Ninety percent is not too much. . . Command activities function on a 24-hour basis, which means all checks cannot be made between 8 a.m. and 5 p.m.



Have you rechecked recently steps taken to conserve gasoline and rubber?



Are you contacting enlisted men? Many activities requiring correction can be discovered by doing so.



Do combat crews understand thoroughly the use and operation of

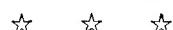
life saving equipment and procedure to be followed when forced down at sea?



When an inspection reveals lack of equipment, are you accepting the answer "a requisition was submitted way back when"? You should check to see whether follow-ups have been made.



Has compliance been made with WD Circ. 118, 1943, pertaining to the disposition of ration savings funds?



Are you being instructive? Helpful? Or just critical?

Extra Spectacles

Many men are preparing for overseas movement without extra glasses. Action to obtain these spectacles should be taken long before the men reach their final phase of training.

WD Pamphlet No. 8-5, May 11, 1943, consolidates all previous directives on the issuance of spectacles, and provides, substantially, that enlisted men will be issued two pair of glasses if authorized, as soon as possible after date of induction. This issuance will be made at the home station without regard to movement overseas.

Due to a temporary shortage of spectacles, WD Circ. 131, 1943, sets up a priority system for obtaining glasses. Numbers 1 and 2 represent the cases where glasses are more urgently needed. Number 3 may be used, for instance, for personnel in the earlier periods of their basic training, and Number 4 for limited service men or other personnel more or less permanently assigned to stations in this country.

The most important consideration is to submit requisitions now. Don't wait until those last busy weeks before the boat sails or the plane takes off for parts unknown.

Good Shooting Takes Practice

When we talk about the need for good shooting, remember we are not only discussing the men behind the guns in planes, but also the thousands of AAF ground soldiers (officers and enlisted men) who are armed. POM inspectors call particular attention to an AAF directive which states that all men will fire the prescribed course for the weapon they carry before being transferred to a staging area or port of embarkation for movement overseas. Responsibility rests on the unit commander.

the day the morning report shows his transfer. If he is going to a school of another arm or service, he needs your help more than ever.

Many AAF enlisted men are being eliminated from these schools because they have not had sufficient basic training of the type given by the other arms and services. Air Corps enlisted men normally receive less basic training than the men with whom they will be competing. All candidates from the AAF should be given an opportunity to take basic training which will help them *prepare for inspection* in their school. (Letter, Headquarters AAF, June 2, 1943.)

About That Morning Report

You don't know how to keep a morning report, sergeant, unless you know how to reconcile the entries. And how about you squadron commanders—do you know how to verify the entries?

Prepare for Combat

In actual combat, a Nazi or Jap will be checking up to find out how well you have heeded the advice of your tactical inspector during training days. Below are some of the points, bearing the seal of approval of overseas combatants, which your inspector will emphasize to get you in the best possible fighting shape to meet the enemy:

Pilot and co-pilot, are you getting in sufficient hours of blind instrument flying?



Navigator, do you know how to check drift reading?

Bombardier, can you run through a good flight pre-check of your bombsight?

Radio operators, can you perform emergency maintenance in flight? Is the interphone system working—have you checked it immediately after getting into the air as well as before?

Aerial engineer, has your ship been correctly serviced? Is the oxygen equipment in shape? Have you checked all engines?

Gunners, how's your marksmanship? ☆

begin with a permanent, all-weather paved field at Agadir, some 250 miles down the coast from Casablanca, below the high Atlas mountains. We have a paved field at Sale, just north of Rabat, which is the capital of French Morocco. We have a paved field at Port Lyautey. The only other field with concrete runways in North Africa is the permanent airdrome at Bizerte which the Germans didn't have time to destroy.

Probably of greatest interest is the story of the airdrome at Bone because it is typical of the Coastal problem and also because it is particularly interesting from an engineer's standpoint.

Bone airdrome is built on the silt which has been dumped there through the centuries by the Seybouse River. This river empties into the Mediterranean in the small gulf where Bone is located. We knew the earth there was nothing but pure gray silt mud because we had seen the craters of several 1,000-pound bombs showing pure clay down some eighteen feet. As a result, every time it rained, Bone became unserviceable, thereby making it very difficult to furnish air cover for the port of Bone—the most important forward port east of Algiers. For a long while Algiers was the most easterly port at which large ships would put in. The British Navy finally consented to carrying on as far as Bone, provided we would furnish adequate cover.

In five days we built an emergency field ten miles west of Bone, known as Tingley, by using a steel runway mat on a small bit of sand we were fortunate enough to find. We knew it wouldn't fill the bill permanently since it was in the mountains and unsuitable for night fighters.

We were asked to finish a suitable airdrome for all-weather operations within two weeks. The only way we could make it operative was to use sand, which was amply available in huge coast dunes. These dunes, however, were on the far side of the Seybouse River, thus posing a major river-crossing problem. In addition, it was raining and we couldn't send any transports out on this mud flat.

We dispatched a battalion of aviation engineers to the site and gave them all the heavy earth-moving equipment in North Africa—turnapulls, twelve- and sixteen-yard pan scrapers with tractors, and all the one-and-a-half-ton dump trucks we could lay our hands on. Then we had the job of getting across the Seybouse River. We accomplished this by starting with the sand from the dunes and building a road ahead to carry us to the Seybouse River. We then bulldozed a causeway across the river and carried our sand by road a mile and a half to the site of the runway.

We figured it would take five days to cross the Seybouse and finish the road, and that we could lay the sand for the runway in the remaining nine days—pro-

AIRDROME CONSTRUCTION IN NORTH AFRICA

(Continued from page 16)

vided we didn't get rain, which would wash away the small amount of sand we could afford to put on the road. Or worse, it might raise the Seybouse and wash out our causeway.

Luckily, we didn't have a drop of rain for two weeks. We built the road and causeway, moved 66,000 yards of sand to the Bone site and built the runway. The sand mat varied from 36 to 48 inches in thickness over a width of approximately 150 feet. As we got the sand in, we followed with the steel plank. On the afternoon of the fourteenth day, we put in the last load of sand and laid the last few pieces of plank to finish the runway. That evening we had a cloudburst. The rain raised the river and later we had major repairs to make to the causeway, but the runway was in and it stayed put.

DURING construction the airdrome was bombed by the Germans two or three times with 1,000-pound bombs. Twice they missed the runway by approximately fifty feet. All we had to do was to scrape the mud off the strip. The battalion also had its camp site bombed. They felt they were veterans. But, to my mind, the thing that pleased them most was what this particular runway meant to a certain crew that came in one afternoon shortly after we had finished it. A medium bomber had been out on a strike and came back over the mountains in a thunderstorm. The pilot had practically no gas left, nor did he know where he was. He didn't know where there was an airdrome in the vicinity either, so he decided the best thing to do was fly straight north until he reached the sea where he knew, because he had done it once before, that he could crash-land his ship and save his crew.

He flew north, reached the Mediterranean and then turned west. He was just sitting upstairs waiting for his gas to run out when a member of his crew shook him and told him to look down. There was the longest runway he had seen in North Africa. He made one sharp circle and landed on it. The plane didn't have enough gas left to taxi off the runway.

A few days before I started back to the

States, I went up to Bone and found it had become the refuge for every type of craft which had to have a place to land in a hurry. I don't think there is a type of Allied ship which was not represented there. In order to help save the runway and also because it was easier on the ships, we built a "belly-landing" strip alongside the runway and invited everybody who came in with his landing gear knocked out to use it.

Our airdrome construction program in North Africa consisted principally in the building of runways and dispersal areas. We built very few revetments. In the first place, we did not have the materials or manpower with which to do the job, had we wanted to. Moreover, the German bombing was not sufficient to require revetments. It is my opinion that the Germans themselves put more effort into this work than it was worth, for in virtually every revetted pen of the enemy's airdromes you could find planes that had been successfully strafed and burned.

We believed that the most efficient method of protecting aircraft was to build individual hard standings for dispersal on the fields or to construct one very large surfaced area on which planes could be dispersed according to a squadron commander's own desires. This worked out very well in practice and saved a vast amount of time and effort.

As it was, plenty of effort was needed on the forward fields for defensive works, of which the well-known slit trench, a ready refuge when enemy planes came over, was the most common variety. At first, some of these fields relied entirely for ground defenses on the .50-caliber machine guns and anti-tank guns of our aviation engineer battalions.

This story of the aviation engineers with the Northwest African Air Force is not complete without mention of the headquarters and topographic companies which formed an essential part of the team. The headquarters companies undertook airfield reconnaissance and survey, and general air force camouflage work.

The topographic companies compiled and reproduced target and flak charts essential to air force operations. These units demonstrated in their work the unflagging zeal and devotion to duty which characterized all of the aviation engineers in Northwest Africa. *

A bulldozer and "sheep's-foot" roller ready for double duty.



AIR FORCE OPERATIONS IN THE BATTLE OF ATTU



P-38 makes a wet landing after raid on Attu.

By Brig. Gen. William E. Lynd

**ARMY AIR OFFICER ON THE STAFF OF THE COMMANDER IN CHIEF OF
THE PACIFIC FLEET**

ONE of the principal challenges facing American forces in the Battle of Attu—almost as great as the challenge offered by the enemy itself—was the effective coordination of air, sea and ground elements in the face of severe handicaps encountered in the weather and terrain.

The Army and Navy air forces had a task to perform in complete cooperation with the attacking ground troops, and the success with which their missions were carried out is a tribute not only to those responsible for the carefully laid plans of the Attu operation but to the men who kept the planes in the air under almost impossible flying conditions.

Army Air Force operations in the engagement were carried out by the Bomber and Fighter Commands of the 11th Air Force from the recently constructed air base on Amchitka under the direct control of the Task Force Commander. Army and Navy aircraft operated in close conjunction during the entire engagement.

AAF planes participating over Attu included B-24s, B-25s and P-38s. The close, low-level support of ground troops was primarily the function of P-38s employing dive-bombing and strafing tactics.

The B-24s and B-25s were used to bomb specific enemy concentrations and, in some cases, to drop supplies to ground troops from the air. P-40s based on Amchitka were used primarily in local defense and to destroy enemy aircraft on Kiska, which lies almost astride the Amchitka-Attu run. The type of Navy aircraft employed was that best suited for an operation of this nature.

When the attacking ground forces stormed Attu from Navy-launched barges on the morning of May 11, they advanced under cover of a fog so thick that men had to be lowered by their heels over the sides of the barges to guide them through the rocky waters approaching some of the landing beaches. But while the ground troops were aided, air operations were severely hampered by this thick overcast.

The fog on the first day was merely a sample of the weather which made air operations extremely difficult during the entire action. Even the distance of 300 miles between the air base at Amchitka and the targets on Attu made every difference in the world. Time and again, bombers and fighters left Amchitka under

clear skies only to find Attu completely fog-bound. On other occasions, ground commanders saw clear weather under the overcast at Attu and watched in vain for supporting aircraft which were grounded by impossible weather at Amchitka.

Nevertheless our bombers and fighters did get through to deal severe blows to enemy positions. Missions were undertaken whenever there was the slightest chance of their successful completion. Frequently, when AAF bombers were unable to get through to Attu, they would return over Kiska and release their bombs on enemy installations on that island.

Seldom did the bombers find a hole in the Attu overcast through which their target could be sighted and their bombs dropped. In most instances they had the opportunity to make bombing runs only when the fog lifted sufficiently to permit them to get under it safely.

It might well be pointed out that despite these handicaps to air operations, there is no known instance of American aircraft hitting our own troops from the air or our troops firing on our own planes from the ground.

Perhaps the most disappointed of the

airmen participating in the Attu operation were the gunners aboard the bombers. Except for the very rare occasions when they had a chance to warm up their guns against enemy ground troops, all they did was wish for enemy fighters that never appeared.

Jap aircraft finally attempted to relieve their besieged forces on the eleventh and twelfth days of the American operations but both attacks failed completely. On May 22, twelve or fifteen twin-engine bombers attacked a destroyer and a gunboat patrolling in the vicinity of Holtz Bay on the north side of Attu but no damage or casualties resulted. One bomber was shot down by anti-aircraft fire.

On the following day, sixteen planes of the same type attempted to bomb American troops on Attu but they were intercepted by five P-38s at about 14,000 feet, well above the overcast. The enemy planes jettisoned their bombs and attempted to escape our fighters. Four of the bombers were shot down in flames, another dropped into the overcast definitely out of control and seven others were seen to go down smoking heavily. Only four of the original sixteen were observed heading west after the engagement. One P-38 was missing and another was shot down but the pilot was rescued.

As of May 24, AAF losses in the Battle of Attu totaled two B-24s, one B-25 and four P-38s. The P-38 Lightnings had definitely proved themselves to be the most effective type of fighter aircraft available to use under such operating conditions and at such distances. The feat of the P-38s in intercepting the enemy bombers 300 miles from their base on Amchitka was significant in this regard.

Actually, the role played by the AAF

Our B-24s banked into steep-walled ravines such as this to strafe Jap ground troops. This and photo at right taken by Gen. Lynd.

Despite the "worst weather in the world," the air arms of the Army and Navy played a prominent role in this first Aleutians offensive.

in the Attu operation began days before the assault troops established beachheads on the island. It was the air job to soften the Jap shore installations by bombing and low-level strafing, and to determine by thorough reconnaissance the most advantageous points at which to land an adequate striking force.

Although the Japs on Attu had no fighters for bomber interception, their anti-aircraft fire was relatively heavy and exceptionally accurate. As a result, formation flying was not needed from a protective standpoint, and by flying individually AAF planes were able to divert and scatter enemy ground fire. In this same connection, area bombing was undesirable and point bombing proved to be the only method of accomplishing the job.

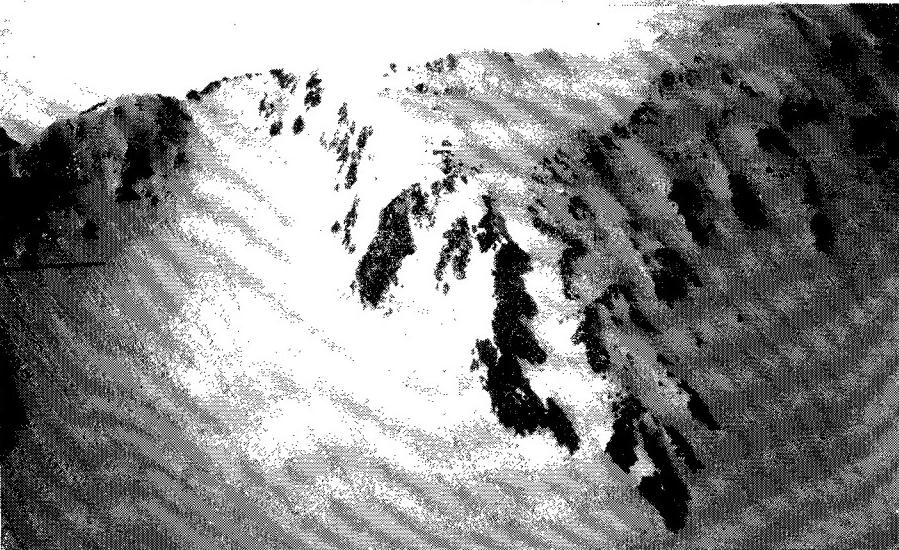
An opportunity for me to observe this phase of AAF operations at first hand came six days before American troops landed on Attu. Six B-24s took off from Amchitka to bomb enemy installations in Chichagof Harbor and in the east and west arms of Holtz Bay. I was the com-

mand pilot of one of the two Liberators assigned to bomb two anti-aircraft batteries in the harbor. As we approached the objective and went in for our bombing run, the Jap batteries opened up. Although their fire was accurate and some hits were scored, the damage was negligible. They continued to concentrate on us after we had completed our run, permitting the second B-24 to come in for an accurate crack at the target unmolested.

Despite the adverse weather conditions, one command plane flew from Amchitka to Attu every day while the battle was in progress. Its pilot was Colonel William O. Eareckson, deputy chief of the Air Staff in Alaska and air officer for the Attu Task Force Commander. I rode in his plane for the first five days of the campaign, and no tribute I could pay to this officer would measure up to the skill and efficiency he displayed in carrying out one hazardous aerial mission after another. His B-24 was in the air over Attu from eight to ten hours out of every twenty-four. Direct contact was maintained between his ship and the Task Force Commander, enabling ground troops to take advantage almost immediately of battle trends noted from the air by Colonel Eareckson and members of his crew.

(Continued on Page 55)

Here is a typical cloud blanket, almost covering 3,500-foot peaks, with which our airmen had to contend.



General Lynd



A DUCK For Our Air Fleet

BY LIEUT. HENRY G. PEARSON
WRIGHT FIELD

LARGE amphibious floats have been attached to the Army Air Forces' C-47, thereby opening the way to new and important uses for this workhorse of the air transport system.

By adding this flotation equipment, Materiel Command engineers have converted the C-47—military version of the familiar commercial DC-3—into a plane which can land on water, taxi to the shore and climb out on dry land under its own power. Successful tests already have been made on Long Island Sound, and additional testing is being continued at Wright Field.

The need for such a ship has become more and more apparent as a result of the difficulties encountered in rescuing AAF pilots forced down at sea in the South Pacific and washed up on tiny coral reefs and islands. The amphibious plane will be able to take off from a land base, set down on the water nearby the island and then, by lowering its wheels, climb onto a beach to load passengers and equipment. Engineers foresee in the amphibious C-47 the ideal answer to the rescue problem.

Another function of the new amphibian



The amphibious C-47 in flight.

may prove to be the landing of this type of plane on snow and ice in Arctic climates. Such landings on amphibious floats have been made successfully, and further experiments next winter may show the amphibious C-47 to be suitable for this purpose.

According to Wright Field engineers, the floats attached to the C-47 are among the largest of their kind ever built. They are over 41 feet long, five feet high and have a maximum width of five feet. The German Blohm and Vose 139 had larger floats but they were not amphibious.

The difference in the handling of the C-47 as a result of the modification is relatively minor. The plane's center of gravity has been moved forward slightly, and landings are accomplished in much

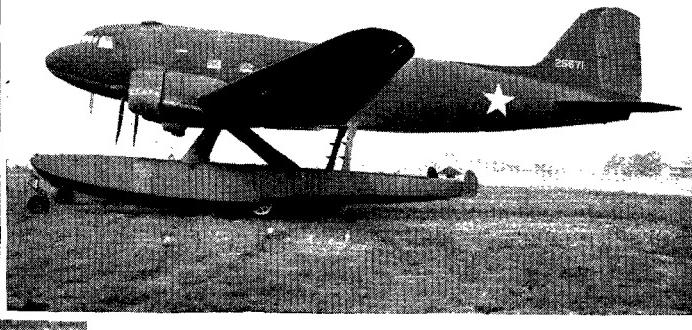
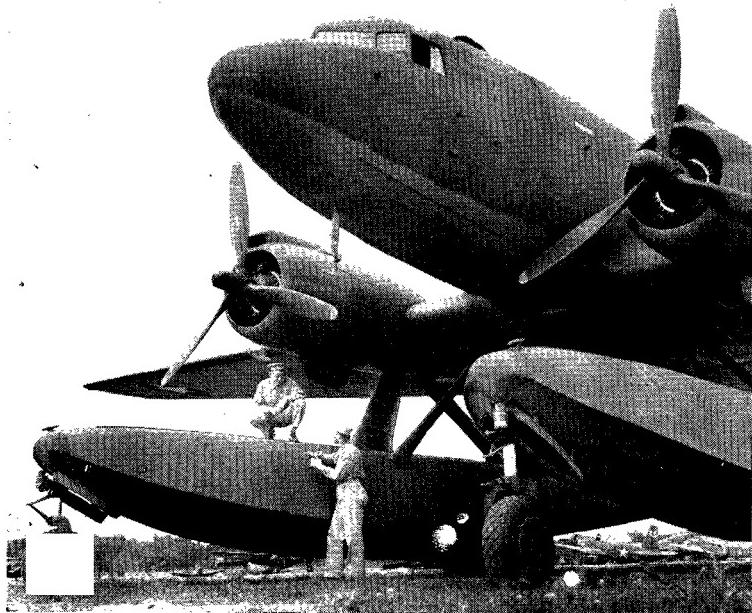
the same manner as in a ship with tricycle landing gear. The load limit is not appreciably affected but the speed has been reduced by the extra weight and drag.

A few modifications in the fuselage were necessary in order to attach the floats. The wheels on the floats retract in the same manner as the wheels on the ordinary C-47. Small water rudders, located on the rear of each of the pontoons, are lowered when the plane is landed on water. They are operated from the brake pedal and are retracted by a device which is attached to the tailwheel lock.

More recent designs of the amphibious C-47 have utilized the center bulkhead of each pontoon as an auxiliary fuel tank capable of carrying 300 gallons. With the 600 gallons of extra fuel, the range of the airplane is greatly extended.

A limited number of these amphibians are expected to be put into service within the next few months.

The pictures below show the comparative size of the C-47's floats.



Flak Suits—Bullet-Proof Vests of the Air

BY LIEUT. ROBERT V. GUELICH

Flak suits for combat crews today are protecting the lives of hundreds of AAF men who have been flying through clouds of bursting anti-aircraft shells over heavily defended enemy positions.

Because fragments of exploding ack-ack shells too often have made it necessary to hospitalize much-needed crew members, special armored vests were developed in England. Now, many of our crew members are wearing infantry helmets and flexible armor suits from the neck to the hips, with a sporran (apron) protecting the thighs. This armor has proved effective in repelling ack-ack and 20 mm shell fragments—protection that has greatly reduced the number of casualties in bombing missions.

Through the work of Col. M. C. Grow, 8th Air Force Flight Surgeon, sixteen-

pound flak suits were developed because they could be carried around at high altitudes without exhausting the crew members. These suits proved their worth on ten heavy bomber crews who first tried out the suits of mail. Scores of injuries and many deaths definitely were prevented.

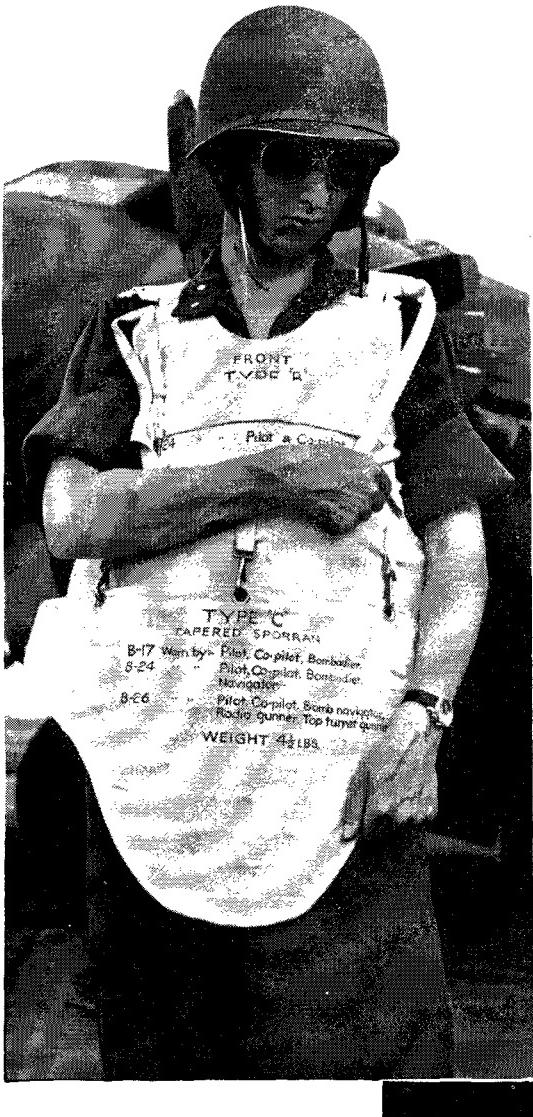
For example, Lieut. Jack Fischer, B-17 bombardier, was on a mission over Europe on May 21 when a 20 mm cannon shell exploded 18 to 24 inches from his chest. Although numerous small wounds in the right arm made hospitalization necessary, several large fragments that might have caused fatal injuries were stopped by the armored vest. Lieutenant Fischer suffered no wounds on the part of his body covered by the vest.

The suits have proved so successful

Maj. Robert J. Reed (left) of the Eighth Bomber Command dons the protective flak vest and tapered sporran, plus a steel helmet.



Tech. Sgt. Wilbur E. Kloth (right below), Major Reed's crew chief, is wearing the full vest and apron used in some positions. Lieut. J. B. Wilkinson of the Flight Section at Wright Field has on the more abbreviated type which permits necessary freedom of action in the cockpit.



and acceptable to combat crews that British establishments are swamped with orders for them and American manufacturers have been called in on production contracts.

At the Armament and Equipment Laboratories of Wright Field, special steel and plastic suits of armor have been tested to determine what materials will offer maximum protection at a minimum weight.

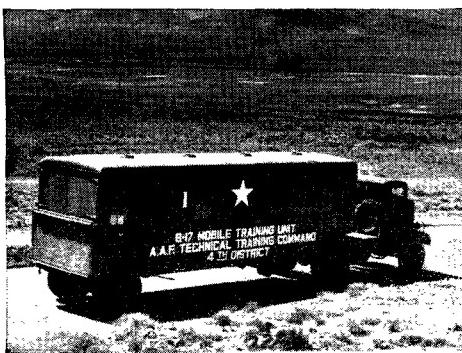
Types under study include riveted and cemented overlapping steel strips (approximately 2½ by 18 inches), overlapping two-inch squares of 20 gauge manganese steel, and solid breastplates. Canvas is sewed on both front and back of each section. The complete vest is hung on the shoulders and can be dropped off in an emergency by pulling one string.

In the North African campaign many pilots and crew members salvaged armor plate from wrecked planes which they wired around the vulnerable spots of their positions. This makeshift protection often stopped fragments that could have resulted in injuries.

The new armored vests are adapted to crew members according to the vulnerability of the positions which they occupy and according to location of armor-plate protection in the airplane. Because their backs are protected by the plane's armor, pilots and co-pilots need additional protection mostly in front. Other crew members wear complete armored suits that give them full protection.

(Technique Continued)

TECHNIQUE



Over a Utah highway en route to an air-base goes a B-17 mobile training unit of the Fourth District, AAF Technical Training Command.

Mechanical Training by Trailers

An innovation feature of the Army Air Forces Technical Training Command is a mobile training unit for visual and practical mechanical instruction. Big, van-like vehicles bring the vital inner-workings of fighting planes to aircraft mechanics on the line. The plan originated in the Fourth District of the TTC and now all Districts have similar units on the road.

To liken it to a travelling classroom is to underestimate its work. Open its stage-like doors, scan its interior and you find a complete mock-up panel system of the mechanisms of a combat plane. Every type used in the AAF is represented by a mobile unit that keeps its instructional setup in equipment and modification constantly up-to-the-minute.

Successful from the outset, the system has mushroomed considerably. Last summer the first unit was established for the P-38. Today mobile units are touring the entire country to service the tactical air forces.

For example, in a B-17 trailer unit, there is a complete cockpit assembly up front with controls and instruments that actually work and can be observed in any operation. A cut-away B-17 engine bares every essential part to close scrutiny, and a cross-sectioned propeller is exhibited in a conspicuous corner.

Nearby, mock-up panels show the construction of the plane's airframe and the operation of its hydraulic and cooling systems. Another panel illustrates the strategic arrangement for fire control apparatus that prevents the spread of a blaze set by enemy shells. Still another panel traces the entire wiring system of the ship enabling the mechanic to follow each minute wire in the circuit.

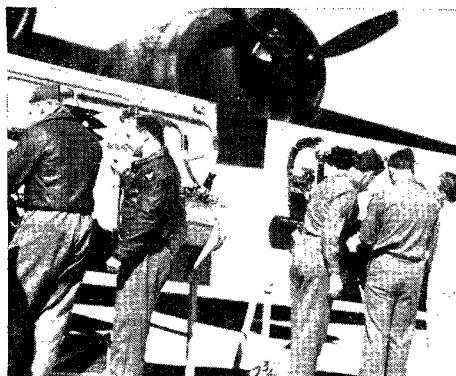
Technical construction of the aircraft supercharger and other engine accessories is revealed by actual cut-away equipment parts and even a life-sized oxygen system is carried along for instruction purposes.

A motion picture projector brings the Technical Training Command's latest training films to the attention of the ground crews.

Most of the instructional material is angled towards the aircraft mechanic, but other AAF technicians, particularly armorers, are also kept abreast of the latest developments in their specialties. Modifications on aerial machine guns and cannon are brought to the attention of the men who service them at their tactical stations.

The compact interior of the mobile unit contains all the intricate mechanisms of the battle plane it serves.

Co-founders of the system were Maj.

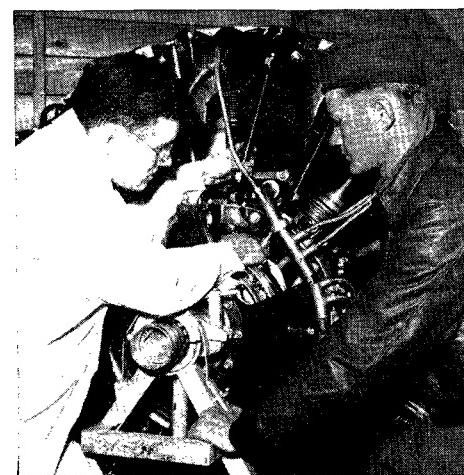


Arriving at its destination it drives right onto the line to display in panel form the "works" of a B-17 to the mechanics who service the planes.

Gen. Walter R. Weaver, Commanding General of the TTC and Maj. Gen. John F. Curry, head of the command's Fourth District. Both were not satisfied with mere classroom and factory instruction. Once out on the line, they held that the men must be further schooled in the practical application of what they had learned and kept conscious of the latest developments.

Then, too, they knew that the planes used in tactical units were not readily available for instruction purposes. These

Inside the trailer a cut-away B-17 Cyclone engine reveals its working mechanism to an onlooking mechanic.

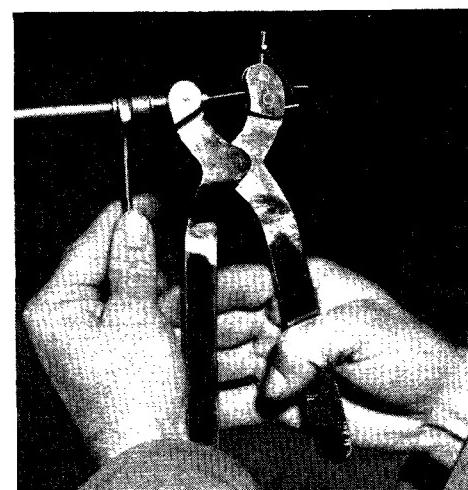


planes might be kept from the hangar for days, perhaps longer, and when they did return to their hangars the fast maintenance necessary to put them back in the air as soon as possible eliminated the possibility of any further mechanical training.

The answer was the development of a mobile unit designed to bring to the aircraft technician on the line all the facts about the plane he was servicing. It was practical application of the knowledge he had learned in a technical school and by means of actual visual instruction he would be better equipped to diagnose the ills of an ailing craft and cure them with speed and assurance.

Each truck trailer unit is staffed by an officer in charge, six non-commissioned instructors, an Army driver and one or two civilian specialists. The soldier-instructors are usually graduates of a TTC school and experienced hands in machinery. Civilian specialists are from the aircraft factories whose planes are represented by mobile units.

"The Mobile Training Unit is a good deal more valuable for its purpose than the technical classroom," says Lieut. Col. Thomas E. O'Connell, in charge of the Fourth District Mobile Training Units. "When line mechanics can see and familiarize themselves with the vital mechanisms for the plane's maintenance they will grasp the fundamental idea of what to do and how to do it faster and more thoroughly." — **Staff Sergeant Jack Angell, Public Relations Office, Headquarters Fourth District, AAFTTC, Denver.**



Cable Tightener

Staff Sgt. Norman Wolfley of Allansville, Pa., has simplified the work on the engines of AT-11 bombardier training planes at the Victorville (Calif.) Army Flying School through a new way of adjusting cables on the engine control. He developed a new instrument (shown above) which is a combination socket wrench and pliers. It tightens cables accurately and easily. — **PRO, WCAFTC, Santa Ana, Calif.**

Individual Light for Code

Formerly visual code instruction signals were given to aviation cadets at the Enid Army Flying School by a large light in each corner of the code room. They had to glance at a light in a corner, then look down at their paper to print the letter.

Under a new arrangement, each code booth now has a radio pilot light in the center only a couple of inches from the cadet's paper when he is receiving the visual code, enabling him to watch both the light and the paper with a minimum amount of eye movement.

Mr. W. B. Teitzel, instructor, states that the new system allows the average cadet to receive from one to two words faster per minute. — **PRO, Enid Army Flying School, Okla.**

Safety Device for Tire Inflation

Not long ago a man was killed at Tinker Field while inflating the tire of a bomber. Recently his fellow workers put into operation a new device which will allow the pumping up of an airplane tire to be done in safety.

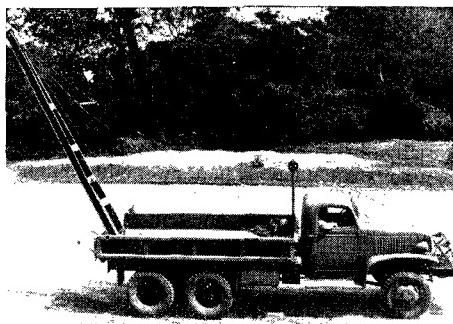
General plans of the device include a metal bin made of boiler plates into which the tire is rolled for inflation. Through an opening in the side of the bin the tire can be blown up to its proper pressure from a regular air hose. Attached to the top of bin is an air regulator which automatically allows a maximum amount of air to enter the tire. Gauges attached to the air hose register the amount of air in the tire at any particular time and the other one shows the maximum pressure of the control gauge setting. A red light flashes while the tire is being inflated.

The idea was advanced by Miles J. Smart, foreman aircraft mechanic in the Landing Gear Installation department, who passed his designs on to Winfield Smith, foreman of the welding section. The pair turned their invention over to Tinker Field, where it is now in use. — **Tinker Field, Okla.**

Combat's Child—C3-1B Crane

On arriving at an island in the South Pacific, the 40th Service Squadron of the 13th Air Force found itself minus a C-2 wrecker or its counterpart, so the engineering section set to work and evolved a crane assembly from a meager supply of parts—mainly salvage—that would do such work as picking up engines, wings and fuselages, and other tasks which occur in the normal course of aircraft repair work.

Two non-commissioned officers, Master Sgt. Gerald V. Eady, Decatur, Ind., and Tech. Sgt. Jack R. Sowers, Rockwell, N. C., working under the direction of First Lieut. Reuben Yarri, Shreveport,



The C3-1B crane, pictured at its birthplace on a South Pacific island.



Lifting a fuselage.

La., developed after two modifications a crane since designated the C3-1B, which has proved very successful. The crane consists of an "A" frame-boom constructed of six-inch by one-quarter-inch channel iron. The frame is bolted to the rear of the bed of a two and one-half ton truck equipped with a power take-off winch. The "A" frame is sixteen feet long with a two-foot base and is welded throughout. Lifting power is derived from the power take-off winch at the front of the truck. The cable is passed by a series of pulleys over the cab to the base of the boom, then to an eight-inch pulley at the top of the boom to the load which is picked up either by cables or a hook.

Loads weighing as much as two tons have been picked up with the C3-1B

Hoisting an engine.



crane but it is not advisable for steady use to lift loads greater than 2,500 pounds, it was found. However, this weight limit permits its use for all aircraft engines, most wings and other aircraft accessories.

Although designed primarily for use while waiting the arrival of a C-2 wrecker, the crane assembly is not replaced by the wrecker. On the other hand, it is a very useful adjunct to the C-2 wrecker, for example in the lifting of B-17 wing inner panels or in picking up a B-17 fuselage. Working together, the two pieces of equipment do such jobs easily.

Should the designation "C3-1B" appear strange to those familiar with stock lists, here's the explanation for it. The letter "C" indicates crane, the figure "3" was so used because this was the third one made; the "1" represents the "A" frame which is the same as the original, and the letter "B" stands for the second modification made on the present crane. — **Lieut. Col. Franklin K. Reyher.**

Artificial Icing in Flight

There was a time when research projects involving test flights in natural icing conditions rarely could be completed on schedule because icing areas are strictly will-o-the-wisps, easy to locate only when you're trying to evade them. Now by the flip of a switch, ice formations can be produced on prop blades during flight.

Wright Field propeller engineers, with a series of anti-icing and de-icing projects coming up, resolved to work out a method by which prop blades could be exposed to icing in flight tests whenever needed.

In one arrangement a special spray was installed in the tail turret of a B-24. Water from two large tanks in the bomb bay is pumped through the nozzle as the B-24 flies in front of the plane being flight-tested. At the right altitude ice forms on the plane trailing in the spray.

In the alternate scheme a single plane is employed. Here an outrigger spray was built which throws moisture from bomb bay tanks into the No. 2 propeller of the B-24 in which it was installed.

To obtain motion pictures of the propeller while it is icing up and throwing off ice during flight tests, the Motion Picture Branch assisted in solving several problems. Propeller engineers prescribed that only one blade be photographed in identically the same position during each revolution at a speed which would result in a sharp image.

This stroboscopic effect was secured by synchronizing the shutter speed of the camera with the rpm of the propeller, thus showing successive stages of icing and de-icing.

It was a tough job but the resulting motion pictures show the pattern and speed of ice building up and being thrown off of the prop during flight. — **Arden R. Strong, Wright Field.** ★

AS YOUNG AS THEY FEEL

THOSE who think of this war only in terms of youth and the present generation forget the thousands of men and women who, though they may have reached their three score years and ten, still have the skilled hands and youthful outlook needed for dozens of tasks which must be done to insure the successful prosecution of the conflict. Many of these young-oldsters have taken their talents into AAF depots and sub-depots throughout the country. They not only are performing their duties well but, more important, they are relieving younger men and women for service where youth in years—and the stamina that goes with it—is a prime essential. Many of these older war workers have left the ease of retirement to share in the fight against our enemies. Some of them are literally backing up their grandchildren who are pilots and mechanics, weather officers and mess sergeants. They have turned again to the lathe, the forge, the saw and the hammer to perform tasks that are just as vital as dropping bombs on Axis factories or building airdromes in the jungle. AIR FORCE presents this picture story of a representative few of the thousands of these men and women who are contributing so effectively to the Army Air Forces' and the nation's war effort.



Six years ago, A. J. Bruce was retired after a half century as carpenter for Santa Fe Railway. Today, at 79, he works the swing shift at the San Bernardino (Calif.) Army Air Depot.

Despite his 73 years, Alfred M. Frothingham commutes daily from Detroit to his job as mechanic and blacksmith at the 96th Sub-Depot, Selfridge Field, Mich. In his earlier years, Mr. Frothingham was engaged in vaudeville and blacksmithing, except for his five years in the Army from 1916 to 1921.



All honors are not claimed by men, even in the upper age brackets. Many grandmothers have dropped knitting needles and peacetime sewing to become full-fledged war workers. Mrs. Myra E. Bradburn, 63, who raises canaries as a hobby, is shown here repairing flyers' clothing at the 29th Sub-Depot, Enid, Okla. She did alteration work for an Enid department store for 21 years.



Down through the years, William E. Dusky, 68-year-old painter at the 29th Sub-Depot at the Enid (Okla.) Army Flying School, has seen many innovations in his trade. He made his start as a painter 54 years ago, and now painting airplane parts with today's paints is a cinch for him.





After a lifetime spent farming and operating a blacksmith shop, John C. "Uncle Bill" Denham, 69, works at the 9th Sub-Depot, Harding Field, La. He has two sons and one grandson in the armed forces.



After retiring in 1941 as terminal agent of the Canadian Pacific Railroad, Francis Dow, 68, has returned to "active duty" as a packer in the shipping department of the 46th Sub-Depot at Houlton, Maine. He has one son in the armed forces in Africa.



Seventy-year-old Rodney A. Waterbury, former Mt. Clemens (Mich.) department store and newspaper advertising executive, puts his long bookkeeping experience to use for the Army Air Forces. He maintains daily stock records at the 96th Sub-Depot, Selfridge Field.

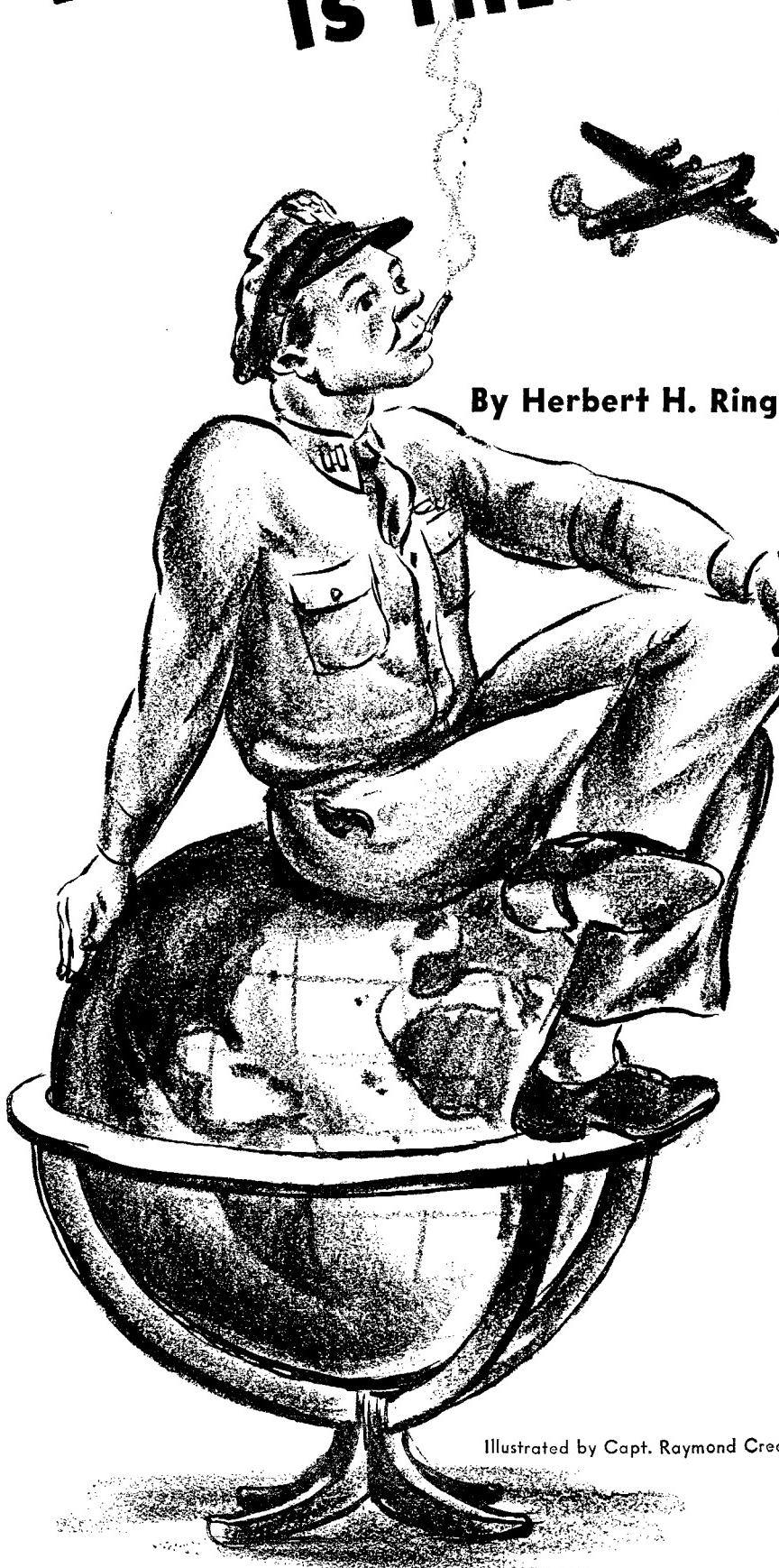


Seventy-year-old Charles E. Baldwin as a parachute jumper (from balloons) at the age of seventeen, was billed as "Professor Baldwin, King of the Air." Now a driver at headquarters of the 40th Sub-Depot, Buckley Field, Colo., Mr. Baldwin takes time out to inspect modern chutes and reminisce. He once performed with Ringling Brothers, Barnum and Bailey Circus.



Newton M. Rice, 71, is employed as an aircraft machinist at the 308th Sub-Depot, Davis-Monthan Field, Ariz. He, too, is a retired railroader, having spent 44 years as a railway machinist. He is pictured with the Just Rite Angle and Bevel Caliber gauge which he perfected.

THE WORLD IS THEIR



Illustrated by Capt. Raymond Creekmore

By Herbert H. Ringold

"**B**EAT a dime."

"I see."

"Up a dime. Say, where's Klotz?"

"I'm out. He went to Russia yesterday."

"How about Dick Kight? There's my twenty."

"By me. Kight's around. Saw him two days ago."

"I play. No, he left for India this morning."

"I'm out. Let's throw away this deck and get one with some aces in it. If these cards don't get any better, you guys will have to wait until I get to China again. The adjutant over there owes me 47 bucks. And it's about time that weather officer in Cairo came through with the six I loaned him."

"Come on, let's play poker. I need some dough myself. I got a date coming up with that British nurse in Karachi."

That's the kind of conversation you get around the poker table, when the players are members of the 26th Transport Group of ATC's Domestic Transportation Division. This is a "special mission" outfit, on call for any emergency—anywhere, any time. To these guys, flying to Moscow or Chungking or Melbourne is about as exciting as going to the nearest latrine.

You sit down beside a couple of them listening to the phonograph playing "Coming in on a Wing and a Prayer."

"Say," says Captain Ralph Reed, "next time any of you guys get down to Natal, pick up a couple of my shirts. When I came back from Africa last time I was too damned tired to get them."

Reed explains why he didn't stop to get his shirts.

"There were 400,000 pounds of high priority materiel piled up at Natal. Rommel was in El Alamein then and the Allies needed that stuff in a hurry. Our CO, Lieut. Col. Willis H. Proctor, was on hand to supervise the job. We had seven ships, and in 36 days we moved 388,339 pounds of equipment over to Africa. All of us made two round trips a week. Each plane had a double crew and one crew would leave Natal at 1700 o'clock and get into the West African base in the middle of the afternoon. We would leave Africa that night and land back in Natal the next morning. The mechanics worked on the ship for five or six hours and then the other crew went out. We got two good nights of sleep out of every five. Let's see, I think I left Natal on Wednesdays and Sundays."

Four meals on four continents in three days is not unusual for these flyers of the Air Transport Command.

Reed hastens to explain that it was all routine flying. Nothing to get excited about. Nothing interesting happened. Very dull and monotonous. A job to do.

"Yeah," says Captain Vernon M. Byrne, "after you jump the ditch once, it gets sort of boring. The only real fun I've had was the time I took 100,000 one-dollar bills over to Africa so the ghost could walk on pay day." (You find out later that he has made eleven round trips across the South Atlantic.)

Captain Joseph E. Kimm agrees with Byrne. "Nothing exciting happens to us. It's the boys in combat who are really doing the work. We just fly around."

"Flying around" to Kimm has meant pioneering the air route up to Alaska, making ten round trips across the ocean and flying the first C-87 to India.

"The fellow who had some fun," Byrne continues, "was Captain Alexis Klotz. He's been around more than most of us anyhow. I think he's in Russia right now. On one trip he carried 7,000 pounds of mercury fulminate. If you sneeze twice that stuff will blow up. If I know Klotz he just set it down nice and careful like, yawned, and made a routine report to operations. His flight plan called for four stops but with that delicate load on board he made it in two."

"Speaking of odd cargo," says Kimm, "Why don't you ask Reed about that stuff he brought in from Iceland?"

Reed laughs. "Oh, I just picked up some Danish pastry in Iceland one morning and my wife and I had it for dinner that night in Washington."

You ask about the kind of cargo they usually carry and are told it is all critical materiel or high-ranking dignitaries. As a matter of fact, the 26th Transport Group claims: "If we haven't flown you, you're not a big shot statesman." Most of the time, the men don't even know the kind of cargo they have in their ships.

Somebody walks over and starts playing "Wing and a Prayer" again. That reminds Reed of the time he was flying a C-87 to Africa. About an hour out of South America, he lost his gasoline cap and the gas started to siphon and leak into the cabin. They cut off the radio for the slightest spark would have blown the ship to hell and gone. They just had to fly around praying until the gas got low enough. And they couldn't contact their base or any curious gunner to announce that they were friendly.

What kind of weather do they find?

Byrne says, "Around Africa you'll find a lot of fronts, but they aren't much to worry about if you play it safe. Go around or underneath them and look for

holes. The best thing to do is run parallel down the coast of Africa and hunt for a spot to get through. But don't try to tear into the fronts at medium altitudes or you'll get yourself a pretty rough ride."

"That's right," Reed adds. "Stay down around 1,000 feet. You'll find that the turbulence is very much lighter. But be sure you are out at sea before you start letting down to 1,000. Otherwise, you'll spread yourself all over an African mountain."

"All you have to do," Kimm says, "is listen to your briefing officers. You get briefed from station to station by experienced men who know their business. Every one of them has flown your route and they go out on periodic flights to check up. Just do what they say."

"Around Puerto Rico, the weather's different," says somebody whose name you don't get. "Down there, you'll find a lot of severe electrical storms. Keep out of the clouds and you'll be all right. It's a good idea to put your wheels down so you can handle the ship better. That slows you down and gives you more control."

You find out that these men run into all kinds of weather. One day they are in a hot climate and the next day it's way below zero. They start out in khaki and wind up in electrically heated suits. A lot of peculiar things can happen when you fly from hot weather into cold, or the other way around. Your oil tanks should be covered in cold weather, but when you get into the hotter climates be sure you remove that cover. In the hot countries don't screw the gas tank caps on too tightly because the gasoline expands and you are liable to burst a tank. If you use a thin oil for winter weather, change it the minute you land wherever the temperature is high or it will congeal and you'll never get it out. If you are flying through severe icing conditions and your manifold pressure starts dropping, don't increase the throttles. You are losing speed because of the ice—just apply heat to the engines, don't boost the manifold.

Captain Reed gets up and says, "Let's go down to the enlisted men's quarters and talk to the men who know that kind of stuff." You walk down to a day room and run into Master Sergeants Wells E. Brown, Clyde W. Nowlin and Leo J. Zulkowsky and Sergeant M. A. Greco.

Brown helped evacuate Java and flew in the last American plane out of the Philippines. Zulkowsky ran the first survey route of Greenland in a B-24. Greco has made nine round trips across the South Atlantic. Nowlin, a charter member of the old Ferrying Command, made the first ferrying hop to Russia and 34

other crossings over both oceans.

Their experiences? "Routine flights, nothing much ever happens." Nowlin does admit that when he landed after his first trip to Moscow, they put a yardstick into the gasoline tank to check their supply and it came out completely dry!

They talk about the fact that they never know where they're going until two hours before the ship takes off. "When we went on one trip," Greco recalls, "we were given maps for both Russia and Japan. Just before we left they told us we were going to Casablanca."

"Talking about Africa," says Nowlin, "if you have to make a forced landing there the bush will seem deserted, but there are few places you can land without being seen. Just wait a couple of hours and some natives will come to investigate. Be sure not to frighten them with a display of firearms. While waiting, don't leave your ship. It's easier to find a plane than a man. If you burn the oil from your engines it will give out a heavy black smoke which is easy to see from above."

"And watch out for the Wogs around Africa," Greco adds. "The Wogs are African soldiers serving the Allies. They do sentry duty and they only understand two words of English—'stop' and 'go.' When they say 'stop,' freeze or you'll get a couple of feet of cold steel through you. Don't play around with those boys."

You ask for maintenance tips.

Zulkowsky says, "Be sure to keep your radio off when you transfer gas in a B-24. The slightest spark will blow you up."

"And when something goes wrong with your radio equipment," adds Brown, "don't take the set apart. Check the plugs and fuses. Instead of tipping out the equipment, look for the minor troubles. You'll usually find a loose plug or a blown fuse causing the difficulty. And when the radio won't work on compass position, nine times out of ten the trouble is in the inverter. Check it thoroughly."

"And tires," Nowlin continues. "In cold climates you check tires for leaks by spitting on your finger, putting it on the valve and seeing if any air comes out. Be sure to blow the vapor out of the valve when you're finished. Otherwise, it will freeze, expand, and you'll get a flat tire."

"Tell the mechs," says Zulkowsky, "to carry enough tools with them to do their jobs. They'll be getting places where there just aren't any tools."

Together they agree that everybody in the crew should know how to do every job. When you are flying for ten and twelve hours at a time the fatigue element plays a big part, and if one man gets tired somebody else can relieve him temporarily. It's always a good idea for everybody to know everybody's business.

As you close the door on the enlisted men, one of them is saying, "Drive into town with you? Not the way you handle a car. It's too damn dangerous." *

EVERY day in some sections of the United States, Army pilots hear the words, "Army Flight Control advises . . .," followed by such warning messages as:

"Heavy icing vicinity of Cleveland between 5,000 and 7,000 feet. Advise change in altitude."

"Your destination closed to all except instrument flights due to low ceilings. Advise landing at alternate or continue CFR to Redfield."

"Violent thunderstorms along your route. Advise you proceed via Yorktown to destination."

These and dozens of other warning messages are keeping Army flights in this country out of serious trouble. No longer is the military pilot a "lone wolf" of the sky. Today for the first time in U. S. military aviation, a system is being installed to plot and trace the progress of every military airplane engaged in point-to-point flight in this country.

This system is being set up by the Flight Control Command, Winston-Salem, N. C. Specially trained flight control officers are being placed in control centers throughout the United States to trace the progress of each airplane and stand ready to dispatch emergency warning messages, with minimum loss of time, through communications stations nearest the pilot.

Here's how the new Pilot's Advisory Service works: A pilot, while planning his flight, selects the radio range stations he will call en route and lists these on his flight plan. All flight plans are sent by the operations offices to the flight control centers for the area, whether the flight is on or off the airways, CFR or instrument, day or night. Every flight is plotted, either on the airways flight progress boards or on specially designed magnetic maps.

Take a look at a flight control center in action. Before you is the magnetic map with markers scattered over it. A moment ago a flight plan came in by interphone from a base operations office. Within a few seconds this flight plan is in the hands of a control officer who inspects it to see that all necessary information has been furnished. An abbreviation code is used to mark up a slip of paper giving the serial number of the airplane, its type, its air-speed, the point of departure, destination, actual time of take-off, estimated time en route and the radio ranges which the pilot will contact.

This slip of paper fits into a slot in the top of a movable arrow marker which is placed on the magnetic map at the point of take-off. Every fifteen minutes this marker is moved along the stated heading for the flight consistent with the airspeed

ARMY FLIGHT CONTROL

Advises...

By Lieut. Col. Ralph J. Moore

HEADQUARTERS, FLIGHT CONTROL COMMAND



At the AAF Flight Control Center in East Boston, Mass., Lieut. Franklin D. Harrington, Jr., maps the positions of military planes in the control area.



Two officers note the movement of aircraft from the magnetic map while the East Boston control center CO, Maj. William L. Thorburn, studies flight plans and progress reports coming in by teletype.

of the plane. From time to time the positions of aircraft are adjusted to coincide with pilots' position reports which are relayed through range stations. At any moment the flight control officer can tell you with surprising accuracy where each airplane is and through which radio range the pilot can be contacted.

Meanwhile, other officers in the flight control center are collecting data on weather conditions in the area. Sources of weather information include the Army Weather Services, United States Weather Bureau, and data furnished by pilots' reports on ceilings, icing, turbulence, etc. From this composite of information an analysis of weather movements is made and studied in terms of the weather conditions likely to be met by each flight.

While this is in progress, another control officer is receiving position and arrival messages, and the teletype is hammering out warning notices concerning fields that are closed, runways under construction, hazardous obstructions, practice tactics that are a menace to planes, and other valuable information.

Thus, at his finger tips, the chief Army flight control officer has complete information on weather, changes in radio navigational aids, traffic and practically every other hazard about which the pilot should know. This is the information on which Pilot's Advisory Service is based.

Let's, for example, take the story of a warning message that got through to one pilot and not to another. The two planes take off from nearby fields for the same destination on cross-country instrument flights. Their flight plans come in to the flight control center and are posted on the Army flight control plotting maps. Every fifteen minutes for two and one-half hours they are moved along on the map. Suddenly the forecaster receives information of unexpected bad weather. A severe

cold front is pushing rapidly across the line of flight, closing both the destination and alternate airports of these aircraft. A warning is prepared and interphoned to the range stations nearest the two planes as indicated on the map plotting board.

Within less than a minute the pilot of the first ship, who has made regular position reports and whose radio is tuned to the range station, hears the attention sig-

nal, a sputter of "dits" in his ear. He switches over to "voice" and hears the radio range calling him. Responding, he is told, "Army Flight Control advises heavy icing thirty minutes ahead of you, and your destination and alternate closed due to low ceilings. Suggest you reverse course and land at . . ." This pilot has no love for heavy ice or low ceilings. He executes a 180-degree turn and in a few moments is sipping a cup of coffee with his feet planted on a stout plank floor.

MEANWHILE, the other plane is moving rapidly toward the heavy weather. Flight Control is getting anxious and has every range station along the line calling the pilot. A dance band or other diversion keeps his radio tuned to everything except the range stations that are trying to reach him.

The weather is thickening. The pilot plows on and finally calls his destination as icing becomes a serious problem. An hour after the other plane is safely on the ground, this pilot is informed his destination and alternate are closed by low ceilings. In reversing his course he encounters even worse weather. Before long, heavy ice is dragging the plane down rapidly. In the nick of time most of the



Lieut. Joseph W. Reeves checks a flight plan while sitting in the control position. Before him are the Flight Control Panel, weather sequences and other data pertinent to a pending flight.

crew bail out, but the pilot jumps too late.

Here were two planes that took off at about the same time, traveling the same route toward the same destination. In one case the flight was safely terminated. In the other case, a potentially good pilot was killed, a crew demoralized and a badly needed airplane was destroyed—all due to lack of proper radio communication with the right stations at the right time.

This is not a bedtime story pulled from thin air to help put the children to sleep. Too often Army Flight Control tries to raise a pilot with an important radio message without success. Sometimes the plane runs smack into the trouble and only by resourceful action is the pilot able to bring the airplane and crew home safely. At other times Flight Control watches planes go on and on to certain disaster while warning messages go unheeded and the pilot and crew either get a free parachute ride or end up in a tangle of wings and twisted props on some lonely hillside.

Army Flight Control will be nationwide in its operations by December 31, 1943. On June 1, 1943 it was activated in the Seattle and Boston Flight Control Centers. Early in July four more centers went into action, in the New York City, Washington, D. C., and the Oakland and Burbank, Calif., areas. Several other centers were to be activated this month. Base operations offices can inform pilots of areas in which Flight Control is offering the Pilot's Advisory Service and pilots should plan their flights accordingly.

Full use of radio facilities is part of the essential training of the young pilot and his crew. It is force of habit with the older and more experienced pilots. Use your radio; tune in on every radio range on your route. You may be the pilot they are trying to locate. And use the Pilot's Advisory Service whenever you pass through an area where it is offered. ☆



How the U. S. Army launched its first great land-air offensive across the Owen Stanley Range.

On July 21-22, 1942, the first units of a Japanese army under General Horii succeeded in landing at Gona Mission. Allied air action against the Jap naval unit of three transports, two light cruisers and three destroyers was intense but insufficient to prevent the beaching of some 4,400 troops and supplies. One transport was set afire and became known as the "Gona Wreck," to be used later by the Japanese in an interesting manner.

This Jap army was subsequently reinforced by several thousand additional men and by September 27 had crossed the Owen Stanley Range, driving to within 32 miles of Port Moresby.

Here Allied resistance stiffened and a strong defensive position was established at Iorabaiwa Ridge.

It is noteworthy that the Japanese never gained air superiority. From July 20, 1942, to January 23, 1943, they raided Port Moresby only about thirty times with no really serious results, and molested our ground forces only occasionally. Our air units harassed their droves at Buna and elsewhere, knocked out many enemy aircraft and later, when our offensive was under way, completely dominated the sky.

However, before our air power could be brought into full play, it was necessary to recapture the landing field at Kokoda, on the enemy's side of the Owen Stanley Mountains.

This was a slow, costly process. Ground units had to drive the Jap back up the jungle track, wiping him out of ravines and pockets in dense foliage where observation was always difficult. Six weeks were consumed before our troops succeeded in fighting back across a gap in the range to take Kokoda on November 2.

By November 4 a landing strip at Kokoda was ready for our use and supplies for our troops began to be flown in. The Japs retreated six miles or so down the Kokoda-Wairope track to make a stand at Oivi, but they were subjected to such heavy ground attack and strafing from the air by Beaufighters and A-20s that on November 11 they were forced out of Oivi with considerable losses.

In this phase of the operation, our airmen kept the enemy's supply lines under daily attack. Particularly heavy bombing and strafing of Wairope, Kakendetta, Pondonetta, Soputa, Sanananda and Buna was done by A-20s, Beaufighters and B-26s.

One of the important troop transport operations began on November 5. American units were flown from the Australian mainland to Port Moresby and from there

THE PAPUAN CAMPAIGN

By Colonel Frederic H. Smith

WHEN the Papuan campaign ended in January, 1943, with the Allied occupation of Buna, Gona Mission and the Sanananda sector, and the complete destruction of General Horii's army, there came to a close the first fully integrated land-air offensive ever undertaken by United States forces.

The action was most significant. Air power was used to its highest advantage, not according to old and narrow concepts of air support but with an eye to all its manifold functions.

In fact, the transport of ground troops and supplies over difficult terrain with a vast resultant saving of time and life was concededly the air arm's most important contribution to the victory. Bombardment and strafing operations were relentless and effective. But always they were subordinate to the mass hauling by air of ground troops, artillery weapons and supplies.

Probably sixty percent of the Allied ground troops were flown by air across the Owen Stanley Range and were landed fresh and in full force close to the battle lines. The troops flown to combat amounted, conservatively, to a full division.

Our aircraft also transported jeeps, machine guns, Befors, 25-pounders and even some 105 howitzers. Other supplies were dropped continuously. Our record day saw approximately 350 tons transported, and a fair daily average would be around 115 tons. The distance was 110 miles

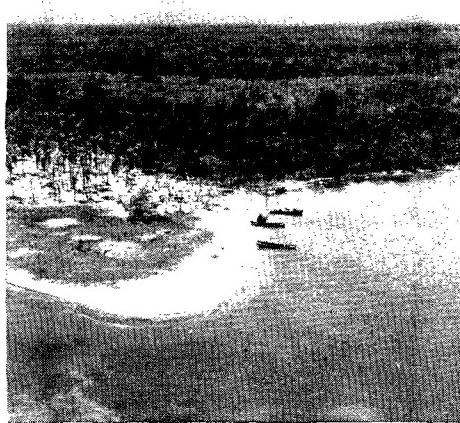
from Port Moresby to the front.

It was this campaign, moreover, that witnessed our first mass air evacuation of casualties. All Allied sick and wounded were flown back across the mountains, accomplishing in less than an hour a journey which normally would have required a couple of weeks by donkey-back.

While no comparative figures are available, it is believed that our air units hauled more—on a per ton-mile basis—than the Germans at any time in this war.

Proper evaluation of the Papuan campaign calls for a brief review of its development and of the circumstances with which our forces were confronted.

Strewn along a New Guinea beach are Jap barges wrecked in an Allied raid. Heavy strafing has stripped the palm trees.



across the mountain range to the east coast of Papua, at Wanigela Mission. By November 15 the whole force with its supplies had been landed at Wanigela, from where it set out on foot for Buna.

THE Japs had obtained some reinforcements but these represented only a fraction of their casualties. Reports at the end of November indicated that some 8,000 to 9,000 of their troops were dead, wounded, sick or missing, and that their force had been reduced from approximately 13,000 to, at most, 4,000. General Horii had drowned in a crossing of the Kumusi River.

After the defeat at Oivi, the next real stand made by the Japanese was on the coast east of Soputa. Enemy resistance was soon reduced to three sectors: Buna, Sanananda-Soputa and Gona Mission.

Gona Mission was the first to fall. The Japs held strongly defended positions and, despite the fact that our A-20s, P-40s and Beaufighters reduced all buildings to wreckage and repeatedly strafed their lines, stubborn resistance continued until Allied ground troop reinforcements were flown right into the forward area. They went directly into action and Gona Mission was finally occupied on December 9.

At Buna there were two fronts—the "New Strip" area and the Giruwa Village area. In the former, the Japs had sturdy pillboxes impervious to 81 mm mortars and 25-pounders. Tanks, however, finally broke the deadlock.

Resistance around Giruwa was also obdurate until the enemy was overwhelmed with fresh troops flown from Port Moresby to nearby Dobudara.

Air attacks had leveled the Buna Government Station and other buildings to ashes (although much credit for this destruction must go also to the 25-pounders of the artillery). But it was not until

'A New Form of Campaign . . .'

General Douglas MacArthur issued the following statement on January 24, 1943:

"The destruction of remnants of the enemy forces in the Sanananda area concludes the Papuan campaign. The Horii army (Lieutenant General Tomatore Horii commanded the estimated 15,000 Japanese troops in Papua) has been annihilated."

"The outstanding military lesson of this campaign was the continuous, calculated application of air power inherent in the potentialities of every component of the air forces employed in the most intimate tactical and logistical union with ground troops.

"The effect of this modern instrumentality was sharply accentuated by the geographical limitations of this theater. For months on end, air transport with constant fighter coverage moved complete infantry regiments and artillery battalions across the almost impenetrable mountains and jungles of Papua and the reaches of the sea, transported field hospitals and other base installations to the front, supplied the troops and evacuated casualties.

"For hundreds of miles bombers provided all-around reconnaissance, protected the coast from hostile naval intervention and blasted the way for the infantry as it drove forward.

"A new form of campaign was tested which points the way to the ultimate defeat of the enemy in the Pacific.

"The offensive and defensive power of the air and the adaptability, range and capacity of its transport in an effective combination with ground forces represent tactical and strategical elements of a broadened conception of warfare that will permit the application of offensive power in swift, massive strokes rather than the dilatory and costly island-to-island advance that some have assumed to be necessary in a theatre where the enemy's far flung strongholds are dispersed throughout a vast expanse of archipelagos.

"Air forces and ground forces were welded together in Papua, and when in sufficient strength with proper naval support, their indissoluble union points the way to victory through new and broadened strategic and tactical conceptions."

tanks and other ground units had forced withdrawals from the pillboxes and had captured the Buna drome, driving the Japs into a grove on Giropa Point, that an end was finally brought to the enemy's resistance in this sector on January 3.

The Sanananda-Soputa sector was the most difficult of the three. Here the Japs held out until January 23. Our aircraft pounded the area relentlessly, making it a mass of bomb craters and wreckage. From November 2 to January 23 there were 43 missions directed against Sanananda. These included strafing operations by Beaufighters, A-20s and P-40s, and bombing by B-25s, B-26s and B-17s.

THE Japs held on doggedly however, in an area about a mile in diameter, even after they had been surrounded. But they were at last broken up into small pockets, which gradually succumbed to our ground troops. Except for minor mopping-up activities, the campaign ended on January 23 with the Allies in complete possession of Papua.

Air power had contributed to the success of this offensive in three principal ways: the transport of troops and supplies; the prevention of worthwhile reinforcement, and the harassment of enemy supply lines.

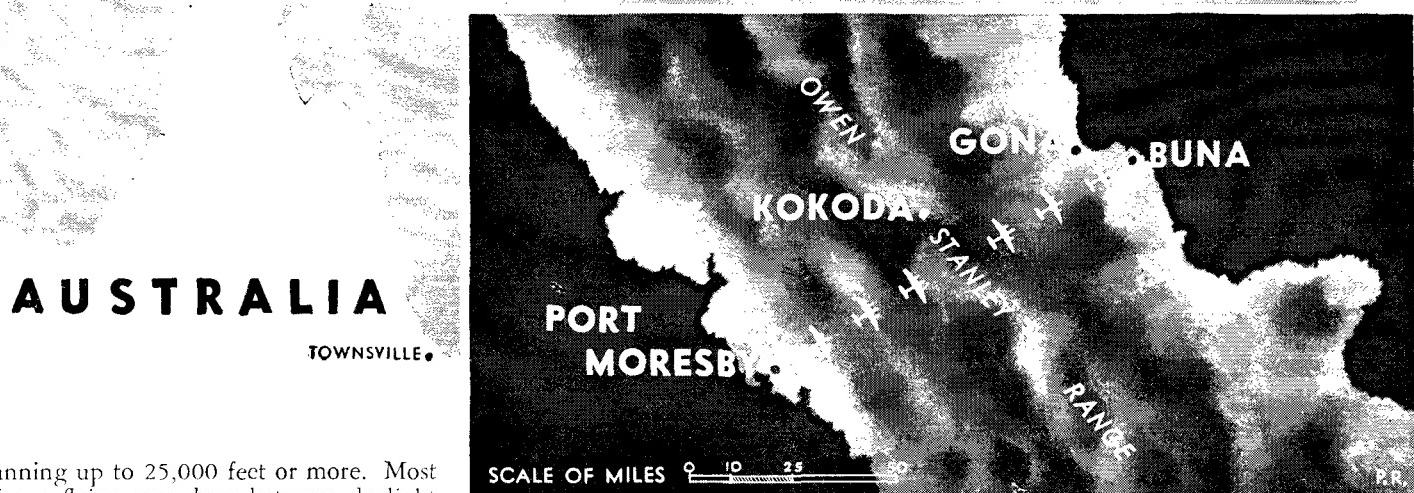
These operations, all under the direction of Major General Ennis C. Whitehead, commanding the advance echelon of the 5th Air Force with headquarters at Port Moresby, were accomplished in the face of severe weather conditions and difficult terrain.

The Owen Stanley Mountains rise to 14,000 feet at certain points and almost always the ceiling above the range is low. Rain falls every day in this area, with as much as forty inches a year at Moresby and perhaps triple that in the mountains. Also, there are tremendous thunderheads

Rifles and ammunition salvaged in action around Buna are brought back by air to an Allied base.



NEW GUINEA



running up to 25,000 feet or more. Most of our flying was done between daylight and noon.

Customary ideas of air support had to be dispensed with, since it was extremely hard to define targets. The Japs rarely presented massed troops against which to direct attack and because of the jungle observation was always difficult, frequently impossible. Results could rarely be determined.

In bombing and strafing operations our air units had to attack well ahead of our own ground forces to avoid casualties. The most effective means by which enemy targets could be defined was through use of smoke shells.

Conditioned by these circumstances, our combat operations developed along the following lines:

P-39s and P-40s were assigned the bulk of our fighter work. Strafing was carried out principally by P-40s, A-20s, B-25s and B-26s, in concert with such Allied planes as Beaufighters. Heavy bombers, including B-17s, were utilized chiefly to attack convoys and prevent successful reinforcement of the enemy.

Our A-20s, B-25s and B-26s dropped many demolition bombs on buildings and storehouses, with much resultant damage, and dropped an unusual number of fragmentation bombs on Japanese troop concentrations. Bombardment operations, however, cannot be considered of vast im-

portance. It is probable that, under the difficult conditions affecting observation and target definition, field artillery would have been more effective had it been possible to get enough of it into forward positions.

All combat missions were flown from Port Moresby, 110 miles south of the main battle area and across the Owen Stanley Range. Scant fighter opposition was encountered. There were some Zeros and other planes based at Buna, but many had been destroyed on the ground before the offensive actually was begun.

While Jap fighter opposition was meager, their anti-aircraft fire was something else again. At many points it was quite heavy and was used adroitly. Anti-aircraft guns were continually being shifted from one emplacement to another for purposes of surprise and were naturally well-concealed.

The "Gona Wreck" was transformed into an anti-aircraft position which, despite repeated bombings and strafings, was effective right to the end of the Papuan campaign.

Our air attacks certainly contributed much to the final victory. During November extensive destruction of supply dumps and gasoline drums was accom-

plished, numerous barges and native canoes being used by the enemy were strafed and set afire, and the Buna Drome was rendered virtually useless.

During December two large-scale attempts to land reinforcements were opposed by our air units. And, while some troops were put ashore in both instances, the attempts were not in themselves very successful. Of the Japanese who landed many were destroyed by strafing, several barges were sunk or burned, and their stores, drawn up on the beach, were left smoldering. What probably was another reinforcement attempt, in January, was broken up far to the north near Lae.

Despite the acknowledged importance of these and other operations, however, it is clear that in view of the bad weather and bad terrain the handling of ground units was the key to the final outcome. It was in the transport of such units and their supplies that our air power was most useful.

Loading and unloading of transports was handled by crews of the ground units, and the work went smoothly from the very outset. Bulky equipment was invariably broken down into small loads for expeditious handling.

The planes used were mostly converted

DC-2s, DC-3s and C-47s, all flown by pilots with troop carrier training. Landing fields were built quickly as our ground units progressed. No mats were used, for our engineers found it fairly simple to construct strips in the open savannahs of the area merely by cutting the grass and doing a slight amount of leveling. This situation obtained only in the Buna area, however.

Throughout the Papuan campaign,

Japanese opposition was extremely determined. They were hopelessly outnumbered and knew it, as the rather pathetic entries in their diaries revealed. But they fought fiercely and with high morale.

Had our ground forces been required to march 110 miles through jungle and over mountains to reach the front, had we not been able to transport by air sufficient reinforcements to bring about relatively quick decisions in certain areas, the

loss of Allied life and materiel against this stern opposition would have been infinitely greater. And there is no estimating the amount of time that would have been consumed in gaining the victory.

Thus, the Papuan campaign, first large-scale demonstration of a modern ground-air offensive by the U. S. Army, was eminently successful and was—to ground and air officers alike—an impressive preview of things to come. ☆



- 1. What is the armament in the B-17 belly turret?**
 - a. One .30 and one .50 caliber machine gun
 - b. Two .50 caliber machine guns
 - c. Two .30 caliber machine guns
 - d. One .50 caliber machine gun and one .20 mm cannon
- 2. When an enemy fighter, just out of range, starts to come in, what is the best thing for an aerial gunner to do?**
 - a. Hold your fire until he closes so as not to waste valuable ammunition
 - b. Give him a burst and let him know you see him even though you can't hit him
 - c. Call out his position and look around for other enemy planes
 - d. Apply for Officers Candidate School
- 3. What is piloteage?**
 - a. Flying by use of maps and recognition points
 - b. The 26 year old age limit established for AAF pilots
 - c. The approved method of flying through an overcast
 - d. Elements of flying taught in pre-flight school
- 4. The best way to prepare your eyes for night flying is by**
 - a. Putting a patch over one eye
 - b. Looking steadily at a red light for approximately ten minutes
 - c. Wearing night adapter goggles for about half an hour
 - d. Eating lima beans

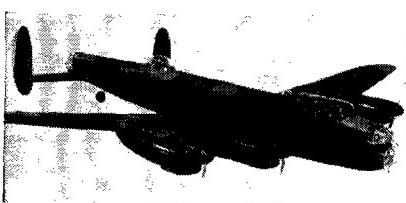
Here's another quest for information, please. Chalk up five points for each question correctly answered. If you score Ninety, the next higher rank is none too good for you. Eighty is excellent; seventy, good; sixty, fair, and fifty, below par. Watch out for the flak. Answers are on Page 44.

- 5. An aviation cadet named Smith is addressed**
 - a. Cadet Smith
 - b. Smith
 - c. Mister Smith
 - d. Candidate Smith
- 6. What is the recommended way to thaw a frozen hand?**
 - a. Use hot water
 - b. Rub snow on it
 - c. Exercise vigorously and allow blood to warm it
 - d. Put it under your armpit or between your legs
- 7. Identify this airplane:**


- 8. You are low over the ocean in enemy territory and your drift meter isn't working. How can you determine wind velocity?**
 - a. Call nearest weather station
 - b. Watch the white caps
 - c. Wet your finger and stick it out of the side of the plane
 - d. Throw something out of the ship and watch it fall
- 9. When a newly commissioned officer receives his first salute, he traditionally**
 - a. Initiates an additional salute
 - b. Never returns the first salute
 - c. Pays out a dollar
 - d. Buys a drink
- 10. What is wave bombing?**
 - a. Torpedo attacks made by dropping bombs on the wavetops
 - b. Coming in low over the waves
 - c. Attacking a target in waves of planes
 - d. Using 100 pounders and incendiaries

- 11. What is a landfall?**
 - a. Hitting the earth from a parachute jump
 - b. A complete victory over the enemy
 - c. Sighting land when you come in from over water
 - d. A term describing the hill-and-dale-like nature of the terrain
- 12. Four Air Forces have permanent Headquarters in the United States. Associate each with its proper location.**
 - a. 1st Air Force
 - b. 2nd Air Force
 - c. 3rd Air Force
 - d. 4th Air Force
 1. Tampa, Florida
 2. Mitchel Field, New York
 3. San Francisco, California
 4. Colorado Springs, Colorado.
- 13. What is the shortest air distance from Dutch Harbor to Tokyo?**
 - a. 2840 miles
 - b. 2260 miles
 - c. 3185 miles
 - d. 1900 miles
- 14. Find the error in the following statement**

The navigator in the P-39 watched the lead plane chandelle up, do an Immelmann, a half-roll, and dive steeply away.
- 15. Army nurses, no matter what their rank, are never saluted by enlisted men.**
 - a. True
 - b. False
- 16. March Field is located in**
 - a. Texas
 - b. California
 - c. Louisiana
 - d. Georgia
- 17. In the AAF the word "mosaic" most commonly refers to**
 - a. A reconnaissance plane
 - b. A temple in India
 - c. A composite photograph formed by matching a number of photographs of contiguous parts taken from the air
 - d. A tribe of Arabs in North Africa friendly to flyers
- 18. Identify this airplane:**





A subject sitting at night vision tester.

The notched knob at left must be oriented with break in lighted "C" flashed across the room. Recorder (below) clicks when the setting is correct.

TESTING FOR

By J. A. Berchtold

WRIGHT FIELD

A NIGHT vision testing machine that determines the ability of soldiers to see objects at night is now in use, and may soon be placed in the Army's classification centers and gunnery schools. The machine was largely developed at the Aero-Medical Laboratory at Wright Field.

Earlier in the war it was discovered that airmen who made the poorest scores in night vision tests generally returned to their bases with the poorest night combat results. This finding immediately stimulated extensive study of the peculiarities of night vision.

Scientists recently have discovered that an entirely different part of the eye is used to spot objects at night than during the day. One can see objects most distinctly at night by looking, not at but to either side of an object, while during the day the clearest image is obtained by looking directly at the object.

Here's how scientists explain the phenomenon:

The eye has two different sets of nerve elements, cones and rods. The cones, located in the center of the retina, make it possible to see objects in daylight or under artificial lighting. Through them, colors and fine details can easily be distinguished. The cones are concentrated in the center of the retina and are scattered thinly toward the periphery. These cones

are of practically no use in discerning objects in dim light.

The rods, on the other hand, are most numerous toward the periphery, away from the center of the eye. For this reason, objects are distinguished at night by the rods because they are about 1,000 times more sensitive than the cones in dim light. Perception of color and detail is a function of the cones, rods are good only for spotting objects in dim light.

Hence, under darkened conditions, objects can best be seen by looking to one side—from five to ten degrees off center. The cones in the center of the eye constitute a "blind spot" at night which few individuals know they possess.

ARMY scientists at Wright Field's Aero-Medical Laboratory, working with the new night vision tester, discovered that the lowest-scoring individuals of any group tested need approximately ten times more light to discern objects at night than do the highest-scoring individuals.

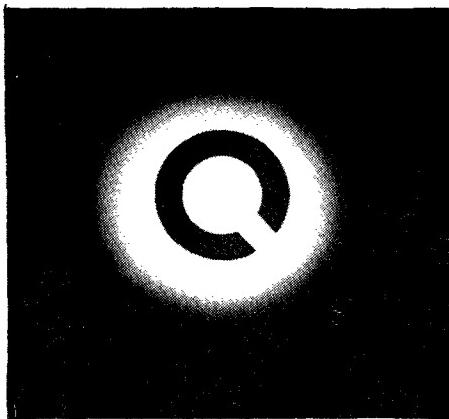
Translated into combat terms, this means that lowest-scoring airmen see an object only if it is twice as large as that same object viewed by men with the highest scores. In more vital terms, it means that those having the best night vision can see an enemy plane at twice the dis-

tance than those with the poorest. This may well mean the difference between success and failure of a mission.

According to the scientists who developed the machine, the average individual has a wide range of night vision and, moreover, men from the country have a more highly developed sense of night vision than those from the city. Experiments have shown that five percent of any group taking a night vision test for the first time fail in the test because they cannot immediately accustom their eyes to looking at an object off-center instead of squarely in the middle. Less than one percent, however, fail the test entirely after being given a second chance.

The night vision testing machine, which will enable the Army to classify its men as to their night vision aptitude, consists of two parts: a rotating white disc (located twenty feet from the subject being tested), in the center of which is a black letter "C" with a one-inch break in it, and a manual recorder with a C-shaped knob which the individual must match with the "C" on the revolving disc.

During the test, the rotating white circle with its black "C" stops forty times, each time in a different position. The duration of each stop is seven seconds, and after each stop is an interval of nine seconds of darkness. At first, the



Lighted "C" flashed on screen.

You don't have to be endowed with cat eyes to see objects at night. This tells you why, and how you can best adapt your eyes for night vision.

NIGHT ADAPTER GOGGLES

THOSE red goggles you are asked to wear for a half-hour just before taking off at night do the job that was formerly accomplished by sitting quietly in a dark room for the same length of time. Use of goggles permits you to read, move around, play poker and, in general, spend a pleasant half-hour just taking it easy. You know, of course, that in order to adapt your eyes for seeing objects in the dark or under dim lighting, a half-hour period is necessary to prepare your eyes for such activity.

Remember, too, that if you look at an illuminated object or

instrument light without those goggles after you have prepared your eyes for night work the "spell" is broken, and you'll need to go through a half-hour adjustment period all over again. Once your eyes have been adapted for night work, even a brief exposure to a bright light will destroy the efficiency of your eyes for spotting objects in the dark - unless you wear the goggles.

You'll discover, too, that the new goggles are extremely flexible, can be folded in the middle, and fit snugly into your shirt or blouse pocket.

These night adapter goggles when worn for thirty minutes prepare pilot's eyes for night flying. Designed for flexibility, they fold in the center and fit into a handy pocket-size case.



white circle is fairly bright, but with each succeeding five stops the light becomes more faint so that by the time the test is concluded, only those with superior night vision can detect the round patch of light. There are eight levels of brightness, each level with five successive stops and each stop in a different position.

During the seven seconds that the white circle is illuminated, the individual must place the "C" knob which he is operating in the identical position of the "C" shown at the other end of the machine. When the light goes off, he is permitted another three seconds in which to make a quick change on the recorder if he feels he might have made an error. An electrical impulse then registers whether he has correctly coordinated the two Cs. Each of the correct matchings is recorded and the total score at the end of the test reveals his rating. A click lets the student know whether he has "hit the mark" each time the machine registers.

On the present system of scoring, those getting from 31 to 40, inclusive, are above average; those with scores from 21 to 30, average; those from 14 to 20, below average, and less than 14, unsatisfactory.

It requires half an hour for one's eyes to become accustomed to seeing objects in dim light. Therefore, men taking the test are either placed in a dark room for that length of time before the test is begun, or they are equipped with red goggles which achieve the same effect.

The night vision tester is operated by a single individual who can test from 250 to 300 persons a day. ☆



By Maj. Gen. Walter H. Frank

COMMANDING GENERAL, AIR SERVICE COMMAND.

KEEP 'EM FLYING — everybody has adopted this slogan. But the Air Service Command is really in the business. The Command's mission is "to maintain the maximum possible percentage of aircraft furnished the Army Air Forces in combat readiness." And the activity of the ASC is a business. On December 16, 1942, the ASC was reorganized on that basis — the activities of the Air Service Command are more closely related to those of business management than of military operation; the Air Service Command is an industrial organization managed by the military."

This is big business, too. Eight months ago figures on the ASC far exceeded comparable ones for General Motors, reputedly the world's biggest corporation. The Command had more personnel and warehouse space, and it handled more material.

The ASC is operated by 300,000 civilians, and the military management consists of approximately 8,000 officers. Another 7,000 officers and 150,000 enlisted men are under its command being trained for Command activities overseas. The civilian personnel represent eighty percent of the total civilian employees of the AAF. In contrast to employees of most other government agencies, only a very small percentage of these civilians are stenographers and clerks. In the ASC they are highly skilled mechanics, technicians, engineers, administrative assistants and executives. The officers, excepting those with service groups, air depot groups and the related training activities, were commissioned mainly from responsible positions with our large peace-time corporations.

These officers bring their experience and

knowledge immediately to bear on their job and find a minimum of military procedure to deal with. The problems they find in the ASC may be bigger than those to which they were usually accustomed, and time is always pressing, but the principles are similar and the solutions of some of these problems have given the Command better systems of property control and maintenance methods than have ever before existed. In fact, when aerial puddle-jumpers become commonplace after the war, the ASC will already have solved, in principle, the problems of supply and maintenance in the age of flight. The ASC has already trained enough personnel to give such industry a good experience level.

How the world's largest "corporation" functions under a decentralization program.

The Air Service Command is the typical expression of modern war. Its organization illustrates the fact that a distinction between industrial activity and military operations is no longer clear-cut. The Command represents a merger and it successfully transfuses industrial experience and effort into military action.

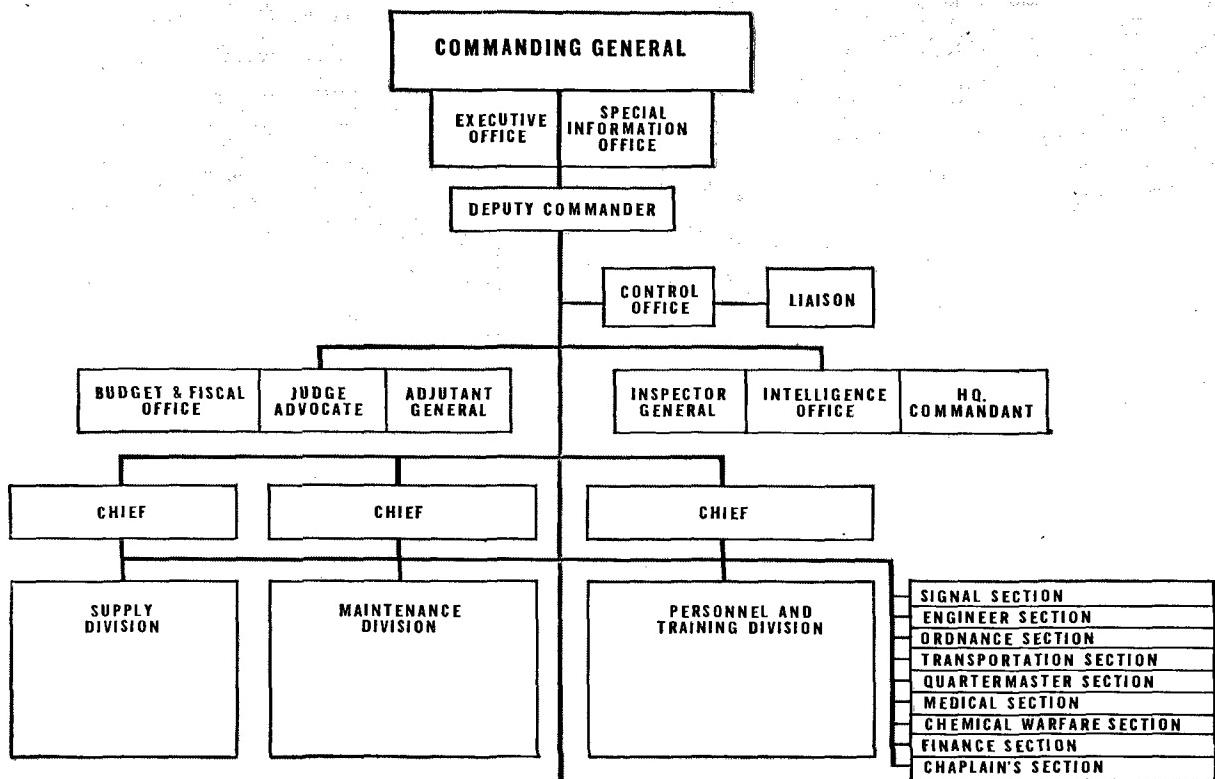
Having recognized its status as an industrial organization, the ASC has abandoned the traditional military staff and introduced a component into the armed forces which embodies a new concept. It was found that the staff organization was not adapted to ASC operations. The activities of the Command did not divide themselves along the lines of the usual staff functions but of the functions of supply, maintenance, and personnel and

training. Experience at sub-depots and control depots had shown that this was a natural grouping. Our headquarters followed suit. The real change effected in the ASC headquarters was not in the abandonment of staffs as such, because their functions are still exercised somewhere among the divisions, special sections and administrative officers; it was the decentralization of authority at the same echelon. The commanding general designated those officers who formerly had been his advisers only, to be definitely responsible for certain functions, and gave them sufficient authority to discharge this responsibility. And now when he requires advice his experts are at hand. Overall planning was established as a function of the control office.

A standard organizational framework was developed and all echelons of the ASC were organized alike. The chiefs of the divisions at Command headquarters were the big operators and had the responsibility for their respective functions throughout the entire Command. This same relation exists between all components at any echelon. Thus, activities which had been traditionally organized along the concept of installation or command were organized vertically without regard to location.

THE idea of management was introduced to the ASC with specialists in organization, procedures and administrative practices. The commanding general was provided a control room where the status of his program was portrayed and all the information leading to necessary decisions was available. The control room of the ASC, which is closely guarded because

AIR SERVICE COMMAND



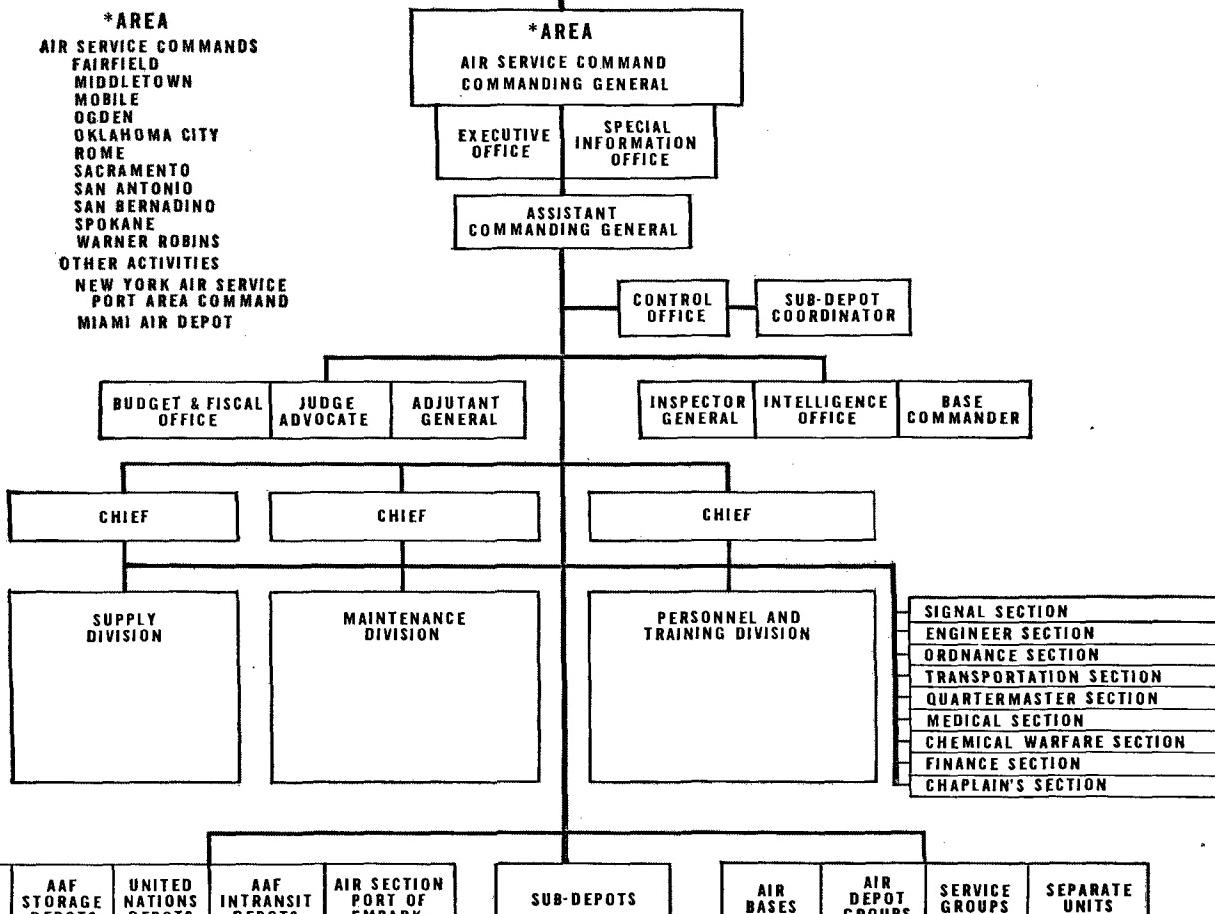
***AREA**

AIR SERVICE COMMANDS

- FAIRFIELD
- MIDDLETON
- MOBILE
- OGDEN
- OKLAHOMA CITY
- ROME
- SACRAMENTO
- SAN ANTONIO
- SAN BERNARDINO
- SPOKANE
- WARNER ROBINS

OTHER ACTIVITIES

- NEW YORK AIR SERVICE
- PORT AREA COMMAND
- MIAMI AIR DEPOT



of the nature of the Command's activities, probably presents as complete a picture of the AAF program and operations as exists outside of Washington.

The committee type of operation was adopted. Instead of a piece of paper, outlining a proposal, being routed through a series of officers for comment and then back again when the comments have been considered, the responsible persons are informed of the problem and called as a committee; final decision is obtained without further delay. The flood of paperwork between echelons was reduced by the application of straightline control and personal contact between echelons.

Most AAF personnel are familiar with the ASC through contact with sub-depots which are only the terminal activities of this Command in the United States. As a result, they frequently are unaware of the huge activities which support these sub-depots and keep the supplies flowing overseas. More supplies are now required overseas than in the United States. The supply division has devised automatic supply tables, pack-ups and ingenious crating procedures. The automatic supply tables are lists of supplies by type airplane for a certain number of combat units, usually thirty- to ninety-day periods, and are shipped without requisition in accordance with movements of plane. Operations from various theatres and changes in design of plane cause these tables to be constantly under revision, and the ASC sends observers overseas to report on these matters. Pack-ups represent a method of putting supplies together for special purposes, eliminating unnecessary unpacking and regrading on the other side and special requisitions.

In the United States the supply division has numerous depots for special purposes and by teletype controls the distribution of hundreds of thousands of items. If a part is required for a plane out of commission and the sub-depot is contacted, it is not just the sub-depot facilities that are being tapped but the whole supply setup in the ASC, because if that part is available anywhere in the United States it can be located immediately on the same network system of property control.

But these operations are routine and do not represent the magnitude of the supply division's task. The real problem of the division is to analyze consumption data, study strategical problems and tactical operations in order to determine projected requirements for planes of the AAF, and those furnished our Allies under lend-lease. The job of preparing a spare parts consumption list for a new type of plane is so difficult in itself as to be mostly "by guess and by God," but the revisions necessitated by experience and changes of design in the plane after it has been in combat all over the globe stagger the imagination. By the time a stock is established it may be obsolete.

But the supply division is on a day-to-day basis and is in constant contact with manufacturers, returning obsolete parts to the production line and flying critical parts directly away. It is safe to say that nowhere in the world is so much material on such a fluid basis.

PERHAPS the best way to explain what the maintenance division does is to begin by saying that this division at Command headquarters receives all Unsatisfactory Reports and issues all Technical Orders. Whenever there are American planes there are T.O.s. They are almost a part of the plane itself and those who operate aircraft must be as familiar with them as they are with the planes and their tools. The job of publishing T.O.s is probably the biggest continuous editorial activity in the world. T.O.s are printed in all languages of our Allies to accompany lend-lease aircraft. They are distributed to every part of the world where there is an American plane. Most frequently this is accomplished by microfilm sent to overseas activities where reproduction and distribution are handled by publication cen-

its career. Maintenance activities extend from the repair of the most delicate instruments in the world to the replacement of whole wings on the biggest planes, and from air-conditioned instrument shops to canvas maintenance shelters in the middle of the desert. The headquarters of the maintenance division may be in Dayton, Ohio, but it is affected by weather conditions all over the globe—sandstorms on the desert and the cold of the Arctic. A small army of manufacturers' representatives is in all parts of the world acclimating their type of planes to the combat conditions encountered and reporting back to the maintenance division and their companies.

The maintenance division does the work and the supply division furnishes materials with which the work is done, but it is the personnel and training division that supplies both the men who supply the materials and the men who do the job.

Obtaining trained civilian personnel is now out of the question. In fact, it is hard to obtain personnel of any sort, and the men who have been trained through the years are being drafted. Consequently, the personnel and training division now relies almost entirely on the procurement of women who are then trained in the complicated techniques of aircraft repair and maintenance. Thirty-nine percent of our present employees are women.

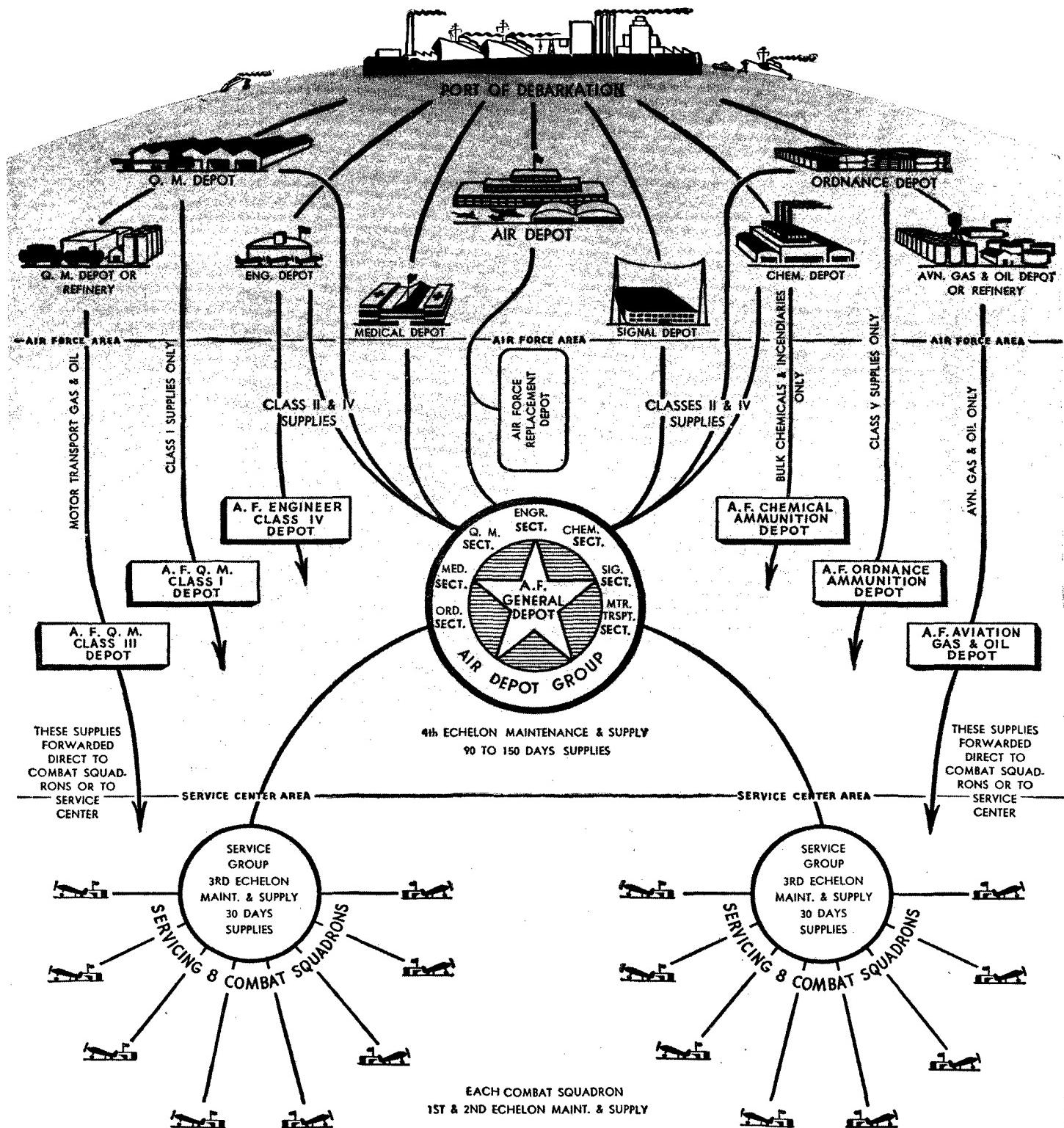
The problem of employment in the ASC is complicated by the fact that our installations are, of military necessity, removed from the large centers of population, with consequent housing and transportation problems. In the face of the many difficulties surrounding our reliance on civilian personnel for basic operations, the personnel and training division has come to be a sociological service spending almost as much time with the problems of housing, transportation and recreation as with the routine personnel procedures. But, as the largest employer of civilian personnel in the AAF, the ASC is making every effort to comply with the spirit and directives of the War Manpower Commission. The policy of utilizing civilians in order to release soldiers was adopted years ago and today every emphasis is on the improvement of functional efficiency in order to effect savings in manpower. Stenographic pools and a system of office management have been established. Occupational Standards are the basis of all personnel actions and the use of machines in all operations such as the preparation of payrolls is universal.

Yet civilian personnel does not represent the division's primary responsibility which is to furnish trained ASC groups and air depot groups for overseas service. These units are probably the largest and the most complicated of the basic organization in the AAF, if not in the whole

(Continued on Page 55)

AAF SUPPLY

IN THEATRE OF OPERATIONS



A I R S E R V I C E C O M M A N D

BE READY FOR ANYTHING

(Continued from Page 7)

their bodies. Soldiers who weren't killed by the blasts were finished off by Marine bayonets.

"We worked closely with the Marines and Navy all the time," explains Lanphier. "And raids would be made by groups of planes. Sometimes, for example, we would fly along at 30,000 feet in P-38s, with a flight of P-40s several thousand feet below us and perhaps some Grummans several thousand feet below them."

"We were so high, in fact, that it was entirely possible for the Grummans to get into a scrap without our seeing or knowing a thing about it. When they wanted to raid us, they called the P-38 a 'high-altitude fox hole.'

"But, seriously, everybody out there knows that the P-38 is good, and far superior to the Zero. It has an exceedingly fast rate of climb, high speed, long range and its guns throw plenty of lead. And it's pretty sweet having two engines when one gets shot out miles from home and the other brings you back."

That business of getting back, say both Mitchell and Lanphier, really taxes a pilot's ability.

In the Solomons campaign missions were long and were flown in all kinds of weather. Time and again, planes would go out on escort under extremely hazardous conditions and upon their return have to land after dark in a heavy rainstorm with no landing lights. Enemy bases were always close and the Japs always outnumbered our aerial forces by four or five or six to one.

"Both living and fighting conditions were about as tough as I want to see them," said Lanphier. "But don't forget,

ANSWERS TO QUIZ ON PAGE 37

1. (b) Two .50 caliber machine guns.
2. (b) Give him a burst and let him know you see him even though you can't hit him.
3. (a) Flying by use of maps and recognition points.
4. (c) Wearing night adapter goggles for about half an hour.
5. (c) Mister Smith.
6. (d) Put it under your armpit or between your legs. 7. Spitfire.
8. (b) Watch the white caps.
9. (c) Pays out a dollar.
10. (c) Attacking a target in waves of planes.
11. (c) Sighting land when you come in from over water.
12. First Air Force, Mitchel Field, New York; Second Air Force, Colorado Springs, Colorado; Third Air Force, Tampa, Florida; Fourth Air Force, San Francisco, California.
13. (a) 2840 miles.
14. There is no navigator in a P-39.
15. (b) False. 16. (b) California.
17. (c) A composite photograph formed by matching a number of photographs of contiguous parts taken from the air.
18. Lancaster.

it's always going to be rugged for a fighter pilot. As this war moves into new areas our men will again have bad food and bad quarters and will again be outnumbered, probably. That sort of thing can't be helped. All you can do—as Mitch says—is be ready for it."

"That raises another point," added Mitchell. "Physical condition. I can't tell you how important it is for a man to be in shape when he gets to the front.

"In the Pacific, for example, it was terribly hot all the time. Many a man came out there in poor physical condition and got sick. You just can't fly when you're sick, though lots of them try and as a result get hurt or killed."

"Especially new men. They don't want other pilots to think they have lost their nerve. So they conceal their illness, take off when they should be in bed, and too often don't come back."

"If you are in shape and have stored up plenty of physical energy, the chances are you won't get sick at all."

Mitchell paused briefly, his face troubled and serious.

"Here's a tough thing to talk about," he said finally, "but it's the truth and should be realized. The majority of pilots who get lost are lost on their first two or three missions.

"Perhaps they grow rattled and leave a formation. Perhaps they're sick. Perhaps they don't know their equipment well enough and something goes wrong. Perhaps they are not familiar enough with the ship itself, with its climbing or turning capabilities. Acrobatics will correct this; it helps you get so used to the plane that you can do things in combat that you will never remember doing. Or perhaps they are just not expert enough at night flying or instrument flying.

"A squadron commander can and will provide last-minute training in combat work. But the prime responsibility is the pilot himself. He must take such advantage of his training here in the States that he is ready when he gets to the front.

"If he does that he has little to worry about. Our planes and equipment are far superior to those of the enemy. Our ground crews do a wonderful job of keeping the ships in fighting trim and they get a kick out of it when you bring down a Jap."

"All that's expected of you is to know how to bring them down." *

PICTURE CREDITS

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IS HE KIDDING?

We don't know whether he is or not, lady—but we agree with you that it's time for him to pass on that copy of AIR FORCE! How about it, soldier? Share your copy of the service journal with the other men in your unit.

PASS IT ON!

AIR FORCE, September, 1943



TARGET FOR TONIGHT...

Well planned and brilliantly executed night operations are becoming more and more important. They depend in large measure on excellent night vision—a faculty which this amorous airman obviously doesn't have.

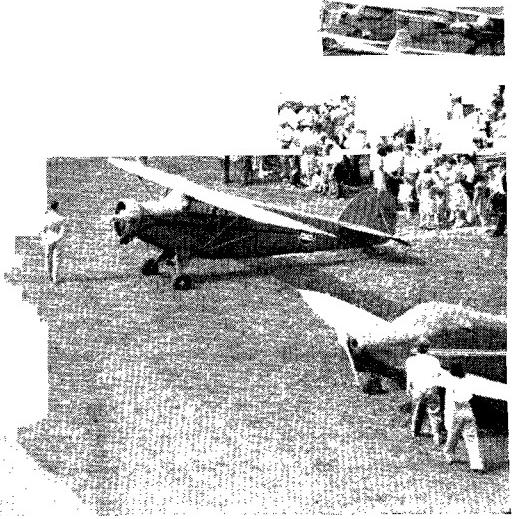
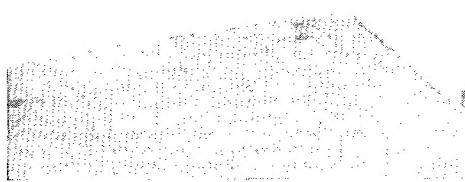
And if he were up 12,000 feet—without OXYGEN—his effective night vision would be only about half what it is now because of anoxia. His chances of locating that "target for tonight" would be practically zero.

(If by now you're wondering how to kiss a girl through an oxygen mask, CHECK WITH YOUR OXYGEN OFFICER.)

More good advice: You can adapt your vision to the dark by wearing special red-lensed, night vision goggles or by staying in a dark room for thirty minutes before a night flight. Eat foods rich in vitamin A—carrots, spinach, eggs and the like. Keep your windscreens clean, and USE YOUR OXYGEN FROM THE GROUND UP AT NIGHT!

With a little study on this night vision problem you won't have to worry about the "MISS" in "NIGHT MISSION."

(This is the first of an oxygen series prepared for AIR FORCE by the Flight Control Command.—Ed.)



Now that Civil Air Patrol has become an auxiliary of the Army Air Forces, its members at more than 1,000 flying fields throughout the United States want nothing more than to be given further work.

CAP was formed a week before Pearl Harbor as a division of the Office of Civilian Defense to mobilize the civilian pilots and planes of the country for volunteer wartime duties. From the beginning, a large and steadily increasing part of its work has been of a military nature, carrying out assignments for the Army Air Forces.

A short time ago the entire organization was transferred to the War Department by Presidential order. Robert A. Lovett, Assistant Secretary of War for Air, declared:

"The transfer is a recognition of a job well done and it is motivated by the desire to make the Civil Air Patrol more directly available to perform its services to the armed forces."

What the disciplined and uniformed volunteers of the CAP can do and earnestly want to do may be briefed under the following headings:

1. Flying services including coastal patrol and light-plane courier work to relieve military personnel and aircraft for other assignments; and ground duties such as guarding airfields and planes.

2. Training of thousands who are headed for the Army Air Forces.

3. Maintaining civil aviation facilities as a wartime auxiliary and as the foundation for post-war development.

The last point could be important to Army pilots, navigators, servicemen and others who desire careers in aviation after the war is over. If home town airports become overrun with weeds, progress we all want to see will be retarded. Meanwhile, a good many Army pilots owe

their lives to the fact that these fields have been kept open for landings.

The CAP has enlisted 80,000 citizens. The minimum age is sixteen and most of the youngsters join the service as soon as they are permitted. The oldest CAP pilot, A. I. Martin, is 81. He has an airport on his farm near Montour Falls, N. Y. Some of the lads who got their private licenses on Mr. Martin's farm are flying for the armed forces in various parts of the world--and there are more coming.

Approximately 100,000 private pilots, a comparable number of student pilots and 25,000 privately owned aircraft were in the United States at the time this country entered the war. The initial task of the CAP was to mobilize pilots and auxiliary workers, such as radio operators, mechanics and photographers, into a military type organization.

UNDER a National Headquarters staffed by a dozen officers of the Army Air Forces, a Wing Command was activated in each of the 48 states and subdivided into groups, squadrons and flights. From the wings on down, the CAP organization is composed of civilian volunteers who receive no salaries and pay their own expenses, except while on active-duty missions. Then they are paid a per diem to cover living costs and a moderate hourly rental for the flying time of their planes.

The largest and most important of CAP's active missions to date is the Coastal Patrol conducted from a series of special CAP bases along the Atlantic and Gulf coasts from the Canadian Border to Tampico, Mexico. The Patrol keeps a

constant daylight watch over the shipping lanes as far out as 100 miles at sea.

Early last year, when enemy submarines began to take a heavy toll of tankers and merchant ships within sight of shore, the Civil Air Patrol was ready although its organization had just begun to function.

The volunteers came with their planes, radios, monkey wrenches, \$4.98 kapok life vests and very little else except their boundless enthusiasm. With no federal funds for many weeks, though aided by contributions from the oil companies, they carried on from their improvised bases, spotted subs and summoned Army and Navy bombers to the kill until the subs were scarce in the waters they patrolled.

These "Flying Minute Men," as they were called by Maj. Gen. Follett Bradley, then Commanding General of the First Air Force, kept their secrets so well that U-boat commanders crash-dived at the approach of CAP planes, not knowing they were unarmed. It was months before bombs and depth charges were hung on these little airplanes at General Arnold's orders—and to good effect.

With the success of the first experimental bases, the protecting chain was extended, first on the Atlantic seaboard and then along the Gulf, until the last gap was closed. Thus the heavier equipment of the Army and Navy was released for other theatres or for patrols further out. By close cooperation between the Army, Navy, Coast Guard and CAP, sinkings close to the mainland were reduced month by month.

These CAP Coastal Patrols, still operating along the entire Atlantic shoreline,

have flown more than 75,000 missions involving more than 20,000,000 miles of over-water flying. They have spotted more than 170 enemy submarines and seventeen floating mines, often in the path of troop convoys. They have reported 83 vessels in distress, observed hundreds of irregularities at sea, made hundreds of special investigations and flown thousands of convoy missions.

Bombs have been dropped against 81 enemy submarines, at least two of which have been listed as definitely damaged or destroyed. These are in addition to the subs which the Army and Navy have accounted for on radio call from CAP. The patrols have located 352 survivors of ship and plane sinkings.

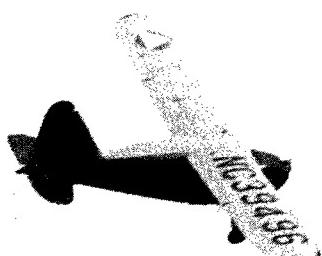
In the course of these missions, twenty CAP airmen have been lost at sea and four in accidents over land. Seven have been injured seriously and 79 planes have been destroyed. Flying over the ocean in single-motor landplanes is hazardous, especially in the winter when flights are maintained at temperatures far below zero. Inland there have been three fatalities on Army courier missions and three on volunteer missions, making a total of thirty CAP members who have lost their lives in the service of their country to date.

High standards of maintenance have been achieved under the most adverse conditions. By pooling their funds and by private contributions, the men on the bases have developed first-class repair centers, sometimes at sites where they have leveled fields and erected the buildings by their own labor.

They are ingenious in devising their own methods and equipment. On one northern base a remarkably successful machine for thawing out motors in cold weather was built from an old oil drum and the bellows from a forge. In high-wing planes the cabin is immediately submerged when forced down on water; to enable pilots and observers to escape under such circumstances, a lever device was invented to pull off the door hinges

CAP plane set to drop food supplies to icebound freighter on Lake Erie. Fifty-pound bags of food were held from right window of plane on a sixty-foot line and dropped to deck as plane came upwind.

The Civil Air Patrol, with an enviable record already on the books, comes to the War Department ready to take on even more work.



This CAP pilot on a training mission drops to low altitude to identify "survivors."

before crashing. Special flotation gear also has been fabricated on the bases.

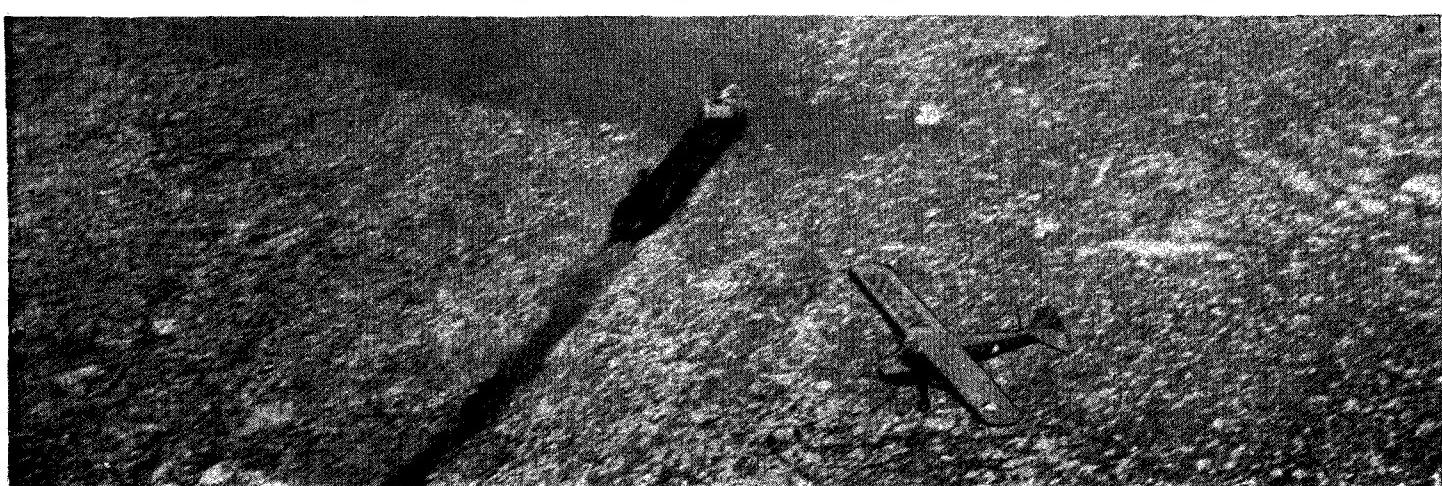
CAP's Southern liaison Patrol flies along the Mexican border, in cooperation with the Mexican Government, to spot irregularites and stop illegal crossings in either direction. Operating from bases similar to those of the Coastal Patrol, the liaison pilots follow every bend in the Rio Grande, flying so low that they can read the license numbers of suspicious autos and give personal descriptions of individuals spotted. More than 1,000,000 miles have been flown on this service without a single fatality or serious injury to personnel. When CAP took over this job, an Army unit previously assigned to the work was transferred to other duties.

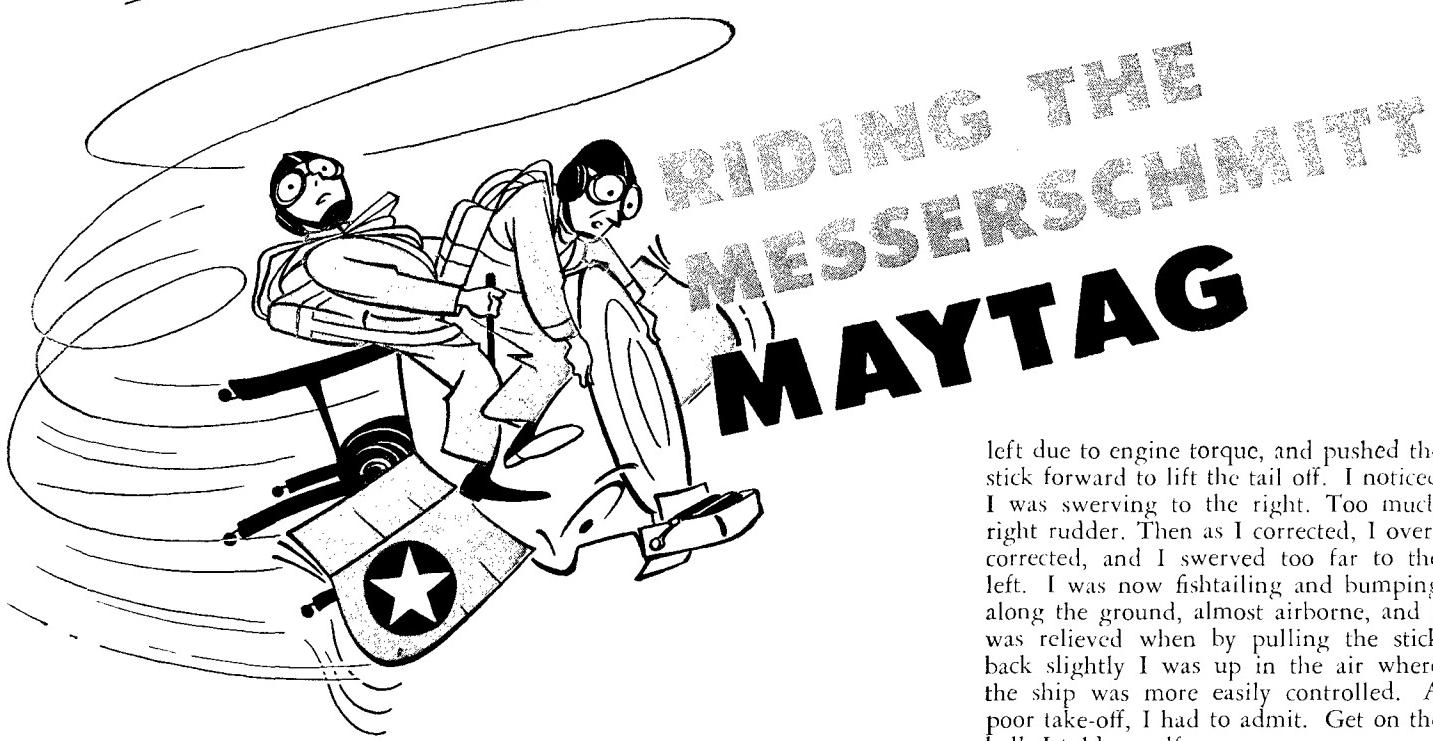
Most of the CAP pilots cannot qualify for military duty. One of the pilots on liaison patrol lost both legs flying in the last war yet, with artificial limbs, he not only flies but even marches in the drills at his base. CAP duties involve no draft exemption. Many members, hopeful of going into the Army Air Forces, are working to build up qualifying flying time and experience on CAP missions.

Potentially larger than the coastal and liaison patrols is the growing network of inland services which CAP has established. For the Second Air Force, CAP pilots coordinated by the Washington State Wing are flying on regular routes and schedules totaling upwards of 20,000 miles daily. More than 2,500,000 miles have been flown on this service to link widely separated Army posts which otherwise would have had to use Army planes and personnel at high operating costs or rely on slow ground methods.

Pilots who know the terrain fly through the mountains rather than over them, winding low along the valleys. They have carried approximately 350,000 pounds of cargo, often including urgent parts and materials, and 40,000 pouches of Army mail.

In the east, CAP planes are standing by at sub-depots ready (Continued on Page 56)





RIDING THE MESSERSCHMITT **MAYTAG**

By Private Charles M. Macko

**BASIC TRAINING CENTER NO. 8,
FRESNO, CALIFORNIA**

I HAD always thought that if my end as an Army pilot came, it would happen with a 20 mm shell exploding in the cockpit during fierce combat with a Focke-Wulf.

I didn't know that plenty of pilots—or, rather, would-be pilots' careers are ended less bloodily during flight training, particularly in primary. Sometimes over half a class are victims of the Messerschmitt Maytag in the washing-out process. It may seem ruthless, but it's a way of getting only the best possible pilots to fly Uncle Sam's hot ships.

How do they determine if a cadet isn't up to the high standards and fast pace of training?

Let's recall my final check ride in primary at Thunderbird Field, Arizona.

Lieutenant Gillesby and I are adjusting our parachutes beside an innocent-looking, blue and yellow Stearman. I knew I had to give him a good ride or I would be washed. I hadn't passed the others. I was nervous, desperately determined.

The lieutenant, blonde, big, solid-looking, smiled reassuringly at me. Well, I thought, at least it's different from the movies. The lieutenant and I aren't in love with the same girl, and he isn't torn between vindictiveness and —

"Mister," the flying officer said, "I want you to relax. Then take me up, and — How many hours do you have?"

"Thirteen, sir."

"Solo?"

I shook my head.

"I see," he said. "Well, the ship's all yours. I won't take over at all unless I want to demonstrate something. You take it off, climb to 2,000 feet and show me power-on and power-off stalls. Then climb to 3,000 and do a two-turn spin. After that, gliding turns to 500 feet, and let me see some S-turns across a road. Maybe I'll pull a simulated forced landing on you. Then take me home."

I knew the routine, all right. In the past three days I had ridden with three different civilian check riders. I had been put up for check when I hadn't soloed after eleven hours and twenty minutes of dual instruction. If my landings hadn't been off, I might have soloed. Now I was being checked on all I had learned to see if I were good enough to be given additional instruction.

Now we were in the plane, the prop was turning over, and the cadet wing-walkers were throwing me well-wishing looks. I released the brakes, turned it and went S-ing toward the take-off point on the runway.

I paused just before take-off and put my goggles over my eyes. I picked out a reference point on the horizon by which I would try to keep the Stearman straight on take-off.

Muttering the old cadet war-cry, "Habba Habba," I pushed the throttle full forward. The engine roared and the plane shook, gathering speed. I pressed right rudder to correct the swing to the

left due to engine torque, and pushed the stick forward to lift the tail off. I noticed I was swerving to the right. Too much right rudder. Then as I corrected, I over-corrected, and I swerved too far to the left. I was now fishtailing and bumping along the ground, almost airborne, and I was relieved when by pulling the stick back slightly I was up in the air where the ship was more easily controlled. A poor take-off, I had to admit. Get on the ball, I told myself.

In flying, you don't have to be a 1,000-hour veteran to tell if your piloting is bad. Even with my microscopic time, I could tell when I rolled out too abruptly in turns that I was not smoothly co-ordinated.

I was now thinking of the stalls and recoveries I'd do. It is an important safety maneuver, particularly the recognition of the exact second you are in the stall, to enable you to recover before you go into a spin. A stall occurs in almost any position, climbing, turning, where airspeed falls off and controls mush ineffectively. To recover, you should recognize the stalling point and then apply the proper correction for a recovery. In the recovery, drop your nose below the horizon to pick up more air speed and increase the engine power.

At about 2,000 feet I made some turns and banks to make sure no planes were below me. I then tried a power-on stall. What you do is set the throttle at cruising and then go into a steep climb. This I did, and soon the Stearman was shuddering uphill with its airspeed down to sixty mph. I kept pulling the stick back as the ship wanted to nose down. Then the controls began to mush. Now—!

I jerked the stick forward and shoved throttle full forward and pressed right rudder, in one motion. The nose pitched down and I held it below horizon in a glide. But, damn it, I was veering definitely to the left. I hadn't used enough right rudder. I did other stalls but somehow I just couldn't get those three movements of stick, throttle and rudder properly synchronized. The stalls were roughly executed. I was glad when I finished the last one.

I went up higher for a two-turn spin. After seeing that the area below me was

clear, I put the plane in a power-off stall, but instead of recovering, I pulled the stick all the way back, held it and then kicked right rudder. The nose dropped off to the right, and I soon was twisting nose down toward the earth which looked like a spinning platter of houses and fields.

A spin and a recovery from one is a test of many things—timing, judgment and keeping your head in a bewildering, befuddling position. In most maneuvers a gentle, silky touch is required on the controls. But in recovering from a spin you have to use smooth but definite violence.

Sure, I can tell you how to do it. Now watch me. I have started revolving to the right. I have picked a house as a reference point. It is upside down. I have gone 180 degrees around it. Now it appears right side up in the view below me. I have completed one turn. I still keep the stick back. Full right rudder. The house becomes upright again. I kick left rudder, pause a fraction of a second and dump the stick forward. The plane shudders in the stress of recovery. And now I notice, instead of gliding, I am plunging straight down in a dive. I have pushed the stick too far forward.

I pull the stick back to get out of the dive before I go into an outside loop, and for pulling back too sharply in my eagerness, Newton's law of inertia punishes me. The plane comes up but my body wants to keep going down, particularly my stomach.

LIEUTENANT GILLESBY, up front, says nothing through his speaking tube. Maybe he's too scared to talk, I tell myself humorously.

I made gliding turns to 500 feet and picked out a road for S-turns across it. I did a fair job correcting for drift, which is one of the purposes of the maneuver. I completed my turns the same distance across each side of the road.

And when Lieutenant Gillesby cut the throttle suddenly, I made a pretty good simulated forced landing. First, I put the nose in a glide to maintain flying speed, then made a turn into the wind for approach to a fairly level green field. It would have been an OK forced landing.

With throttle forward again, I headed for home and my biggest test—landing.

The idea of landing a plane is simple. Gliding in with motor idling, you merely stall the airplane a few feet off the ground.

The first problem is to fly the correct approach to the field or get into the "pattern," which changes with the direction of the windsock or tee. You first fly downwind outside the field, then make two ninety-degree turns, finally gliding down into the wind.

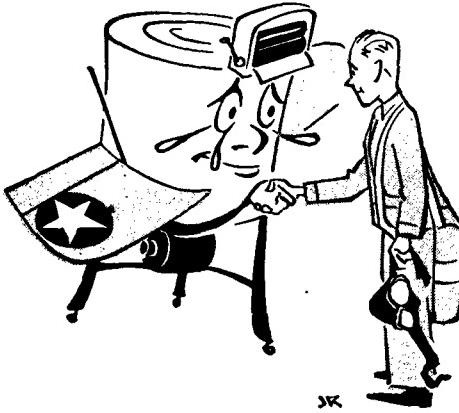
I got into the pattern at 500 feet and kept watch for other planes. I made my first ninety-degree turn, straightened out

This former aviation cadet gives a straight-from-the-shoulder account of his wash-out in primary and his feelings in the matter.

and looked rapidly for a landing lane clear of planes. I found it and then cut the motor to make my last ninety-degree turn a gliding turn. Because your airspeed is lower in such a turn, your airfoil reactions are less effective so I generously gave plenty of left rudder. I thought the ship would never stop turning. I had given enough rudder to turn a Flying Fortress. After some violent fishtailing, I finally established a straight glide down.

I watched a fixed point to see if any cross wind was causing me to drift. It wasn't. Otherwise I would have had to dip one wing slightly into the wind and use a little opposite rudder.

The ground was steadily coming up to meet us as we glided over the edge of the field. Now only about fifty feet. Shifting my eyes, I looked down below. The ground was going past in a blur. Idiot! Remember what your instructor told you: look ahead to a point where the ground doesn't blur. I did but I lost my refer-



ence point ahead. Confused now about my actual altitude, I instinctively pulled the stick back to take the plane out of glide and into a stall. But with too much airspeed left, the plane zoomed, and now I could see I was going to stall—but about twenty feet off the ground. Never a dull moment with Charlie!

I pushed the stick and the nose of the plane down to gain airspeed. I gained some but before I could pull it out of the glide, my wheels hit the ground and the plane bounced—but hard. That was unexpected and a little too fast for me. I pulled the stick back to stall it and keep the tail down, but still the plane had too much airspeed and it leaped some ten feet off the ground, then bang, down again with a terrific jar. Still worse, the Stearman began veering to the right.

Lieutenant Gillesby grabbed the controls and, in a fast blur of movement,

averted a wing-scraping. He retained control of the airplane, taxiing back to the hangar. I felt ashamed of myself.

As I got out of the cockpit to talk to Lieutenant Gillesby, I knew what the decision was.

But I asked anyway, "Well, sir?"

"Mister, you don't have it. Not enough coordination. Your turns were rough. You don't match pressure on rudder and stick. You muffed your stalls because you couldn't coordinate all the movements required. I don't know the reason for that bad landing, but it was bad. Sorry, but I will have to recommend you for elimination."

THAT was straight from the shoulder. Automatically, I saluted and left. My eyes smarted, for it is damn hard to take a defeat of hopes and dreams.

My old instructor, one of the civilian flyers employed by the field, saw me in the flight room and tried to cheer me up.

"You can still fly. You just can't learn fast enough. The Army wants men who have a high degree of aptitude because they have to learn fast—first in PTs, then BTs, then ATs and finally in even hotter combat ships."

"If I only had some stick time before I came here," I mused. But then I got realistic, "But, hell, my trouble is coordination, or a lack of it."

"In that case," he said, "we are just saving you from some fatal mistakes you might have made later in a hot ship."

I was too disappointed, however, to appreciate the implication that Lieutenant Gillesby had saved my life.

I joined the other wash-outs in another barrack.

"Why did you wash out?" is the question we eventually ask each other.

The answers may be evasive as, "Oh, I gave the final check ride a rough ride," or perhaps some more bitter comments on the check riders' judgment.

Most of those who are eliminated usually fail, as I did, because of insufficient coordination. There are others who carelessly get into such accidents as groundloops and can't survive the checks given after an accident. There are some victims of airsickness. Others wash because they disobey regulations, engage in dogfights or formation flying before they are ready. A very small percentage is eliminated because they have threatened cadet officers or have overstayed passes.

The number of men who wash out always strikes one as being wasteful. Most of the boys can fly, and fairly well, too. But even I, disappointed as I am, can appreciate the Army's aim. It wants the cream of the crop to make the best pilots in the world. The standards for Army pilots haven't been lowered in this war. You don't believe it, ask those young men who have ridden the Messerschmitt Maytag. ☆

Illustrated by James T. Rawls



A MONTHLY RECORD OF DECORATIONS AWARDED TO PERSONNEL OF THE ARMY AIR FORCES

DISTINGUISHED SERVICE CROSS

MAJORS: Ronald D. Hubbard, Herman F. Lowery, Kenneth McCullar*. (Also Distinguished Flying Cross with Oak Leaf Cluster), Robert F. Strickland. **CAPTAINS:** James R. Smith (Also Distinguished Flying Cross), Iran Sussky. **LIEUTENANTS:** Bernard E. Anderson, Kenneth W. Howat (Also Purple Heart, Distinguished Flying Cross and two Oak Leaf Clusters to Air Medal), Robert G. Oestreicher. **SERGEANT:** Wilbert R. Burns. **PRIVATE:** Ray J. Matchitt*.

DISTINGUISHED SERVICE MEDAL

LIEUTENANT GENERAL: Delos C. Emmons (Also Air Medal). **MAJOR:** William G. Benn.

SILVER STAR

COLONEL: Leon W. Johnson. **MAJORS:** Harvey J. Scandrett (Also Distinguished Flying Cross and Air Medal), John A. Thompson (Also Distinguished Flying Cross). **CAPTAINS:** Thomas T. Dabney (Also Air Medal), Fred P. Dollenberg (Also Distinguished Flying Cross and Air Medal), Justus A. Emens (Also Purple Heart), Curran L. Jones (Also Distinguished Flying Cross with Oak Leaf Cluster and Air Medal with two Oak Leaf Clusters), Thomas G. Lanphier, Jr. (Also Distinguished Flying Cross). **LIEUTENANTS:** John G. Brennan, Henry D. Chism, Jr., Leonard E. Edington (Also Distinguished Flying Cross and Air Medal), Paul Pestel, Byron R. Work (With Oak Leaf Cluster), R. W. Yundt (Also Distinguished Flying Cross and Air Medal). **STAFF SERGEANTS:** Fred J. Best, Adolph Buda, Clarence E. King (Also Distinguished Flying Cross), Tom P. Rogers (Also Distinguished Flying Cross). **SERGEANTS:** Arthur Karlinger* (Also Purple Heart*), Robert B. Lowrie (Also Purple Heart), Ollie Michael (Also Air Medal).

OAK LEAF CLUSTER TO SILVER STAR

LIEUTENANTS: E. J. Nossom, Horace E. Perry. **PRIVATE'S FIRST CLASS:** Edward Van Every, Herbert M. Wheatley, Jr.

* Posthumous

PURPLE HEART

LIEUTENANT COLONEL: Stuart M. Porter. **MAJOR:** Chauncey B. Whitney*. **CAPTAINS:** John A. E. Bergstrom*, Edward W. Robinson. **LIEUTENANTS:** Kenneth L. Alspaugh, John D. Lawrence, Donald Eaken, Marshall L. Forshey, David L. Gaede, Paul J. Grueser, Thomas L. Hayes, Jr., Arthur N. Inman (Also Distinguished Flying Cross and Air Medal with Oak Leaf Cluster), Donald J. Kundinger, Joseph F. Kane*, William A. Lorence, William W. O'Neil, Arnold W. Postelle, Burt H. Rice, Eugene A. Wahl. **WARRANT OFFICER:** Jack E. Day. **MASTER SERGEANT:** Edwin F. Rhodes. **TECHNICAL SERGEANTS:** Almond E. Caird, Thomas J. Coburn, Otto T. May. **STAFF SERGEANTS:** Nicholas T. Brozack, Carl A. Knutson, Myrvan R. Morley, Gerald H. Watson, Terrel Henry Wood. **SERGEANTS:** Oscar R. Billings, John G. Cottros, Archie Cothen, Eritrea E. Del Vecchio*, Ray L. Draper, Bobby H. Gordon, Russell L. Hultgren, Charles E. Stafford, William R. Whalon. **CORPORALS:** Edwin W. Burns, Jennings G. Beckwith, Angelio P. Delucia, Leonard K. Florence, Carroll J. Ferguson, Darwin A. Garrett, Harold Kissel. **PRIVATE'S FIRST CLASS:** Robert R. Kelley*, J. B. Sparks*, Edwin A. Tischbirek, Anderson G. Tennison*. **PRIVATE:** Jack H. Feldman*, Stuart H. Fiander*, Stanley R. Foster, Leo E. A. Gagne*, Robert H. Gooding*, Joseph Jedrysiak*, Bethel L. Kniphfer, Roderick O. Klubertanz*, Otto C. Klein*, Andrew J. Kinder*, John A. Mayberry, Russell M. Penny*, Hal H. Perry*, Clarence M. Poulsen, William T. Rhodes*, Halvor E. Rogness*, Anson E. Robbins*.

DISTINGUISHED FLYING CROSS

CAPTAINS: Robert C. Beebe, Raphael Bloch, Jr. (With Oak Leaf Cluster and Air Medal), Howard Burkanna, Jr., Robert M. Creech,

Robert E. Hawes (With two Oak Leaf Clusters) and Air Medal with two Oak Leaf Clusters), Earl R. Kingsley (Also Air Medal with Oak Leaf Cluster), Clayton L. Peterson (Also Air Medal), Wayne H. Rathbun (Also Air Medal), Lloyd L. Reynolds, George Simmons (Also Air Medal), Richard Taylor (Also Air Medal). **LIEUTENANTS:** Malcolm K. Andresen, Walter O. Beane, Jr. (Also Air Medal), Jesse M. Bland (Also Air Medal), Hubert S. Bronson, Bernard Cederholm, Andrew Cook, Jr. (Also Air Medal), Thomas D. DeJarnette (Also Air Medal), James W. Egan (Also Air Medal), Irving A. Erickson (Also Air Medal), Cleveland D. Hickman, Glenn L. Johnson (Also Air Medal with three Oak Leaf Clusters), Robert S. Knight, Melvin C. Lewis, William G. Newman, John Y. C. Roth (Also Soldier's Medal and Air Medal), Glenn J. Schaffer (Also Air Medal with Oak Leaf Cluster), John F. Stroup, Anthony C. Yenalavage, Howard N. Young. **FLIGHT OFFICER:** Wilbur M. Hackett. **MASTER SERGEANT:** Gust D. Portl. **TECHNICAL SERGEANTS:** Nicholas J. Andreas, Anton J. Budgen, William Ludkiewicz, Daniel F. Morton, Jr., James R. Shackelford (Also Air Medal). **STAFF SERGEANT:** Theron R. Jones. **SERGEANTS:** Jack Archer, Clarence L. Campbell (Also Air Medal), Charles J. Geyer, Albert K. Will. **CORPORALS:** Elmer F. Awtry, William C. Myers. **PRIVATE'S FIRST CLASS:** Louis D. Gardiner, John R. McNellis.

OAK LEAF CLUSTER TO DISTINGUISHED FLYING CROSS

COLONEL: Emmett O'Donnell, Jr.

SOLDIER'S MEDAL

CAPTAIN: Alexis Klotz. **LIEUTENANTS:** Dale Davis, Elmer J. Gedeon, Robert Kernan, Paul M. Lindsey*, Harry Patteson. **MASTER SERGEANTS:** Howard W. Deal, George M. Dun-

can. **TECHNICAL SERGEANTS:** Kenneth Addis, Richard J. Barrett, Jr. **STAFF SERGEANTS:** Forrest M. Beckstead, George W. Gunn, Douglas H. Logan, Clarence L. Singsank. **SERGEANTS:** Wayne C. Martin, Victor P. Minkoff, Howard S. Petersen. **TECHNICIANS FOURTH GRADE:** Edward J. Dowling, Malcolm B. Levison. **PRIVATE** Joseph W. Adrian.

AIR MEDAL

MAJOR GENERAL George E. Stratemeyer. **BRI-GADIER GENERAL** Frank A. Armstrong (Also three Oak Leaf Clusters to Distinguished Flying Cross). **COLONELS:** Walter W. Gross, Kenneth B. Hobson, George F. McGuire. **LIEUTENANT COLONEL** Dale O. Smith. **MAJORS:** Donald J. Green, Francis H. Matthews, Marvin E. Walseth. **CAPTAINS:** Benjamin C. Adams, Archibald D. Anderson, William H. Arthur, James F. Berry, Edward D. Black, Howard F. Butler, George C. Cranston, Kenneth C. Dempster, Charles G. Esau, John E. Fox, John K. Hall, George W. Haney, Carl David Hoffman, George K. Hughel, Frank MacDougall Hunt, Donald M. Hyland, Virgil Ingram, Jr., Lawrence E. Jarnigan, Jr., Edward L. Jenkins, William D. Jernigan, Ralph E. Jones, Jr., Jacob P. Sartz, John Uriek. **LIEUTENANTS:** Louis M. Abernathy, Lloyd Adonson, Peter K. Arpin, William E. Ayres, John A. Balaban, Junior M. Barney, Charles J. Barr, Jack Best, Rachel N. Bethune, Ralph A. Birk, David B. Bishop, William Emanuel Black, Jr., Alfred D. Blair, Raymond W. Boggs, Charles Felk, Clyde V. Knisley, Jr., Martin E. Liche, Allan R. Lind, Herbert E. Lindhe, Marion G. Lloyd, Robert H. Long, William A. Loudermilk, William D. Lown, Raymond Lunenfeld*, Alvin M. Lusk, Raymond

B. MacDonald, Donald L. McKay, Edward Joseph McPherson (With two Oak Leaf Clusters), George R. Mason, Thomas F. Magruder, Harrison L. Marshall, Paul M. Means, Orval H. Michelson, Maurice L. Minett, Howard A. Moore, Charles E. Morris, Clement K. Miller, Albert C. Naum, Edward R. Neff, Joseph H. Nesbit, Kenneth L. Ogle, Jr., Clifford R. Oliver, Ben L. Parker, Harry G. Peterson, Michael G. Phipps, Ray L. Pittman, Belah O'B. Price, Darwin F. Rasmussen (With Oak Leaf Cluster), Levon L. Ray, William J. Rhodes (With Oak Leaf Cluster), John E. Richards, William M. Riddle, Charles F. Rogers, Arnold Z. Rosoff, Hardin E. Ross, Jr., Joseph P. Schilling, Jr. (With Oak Leaf Cluster), David Herbert Schreiner, Meldrum L. Sears, Robert L. Sheelden, Robert E. Speer, Arland Stanton, Roger P. Stein*, Benjamin J. Stone, Jr., Floyd F. Strohl, Don L. Sutliff, LaVern B. Terrell, Donald V. Thompson, Walter E. Thorne, Oliver E. Tilli, Fred Herman Towne, Jr., Claude A. Trotter, Jr., Robert F. Valentine, Robert C. Velan, Hussell M. Vifquain, Irving W. Voorhees, Jr., Harold E. Ward, Lucian K. Wernick, Robert W. Wert (With two Oak Leaf Clusters), Roy E. Whitaker (With Oak Leaf Cluster), Robert H. Wilder, Rayburn A. Wilks, Howard C. Williams, Jr., Raymond R. Yahr (With two Oak Leaf Clusters), Edwin A. Yelton. **TECHNICAL SERGEANTS:** Walter B. Belleville, Jr. (With two Oak Leaf Clusters), John F. Clark, Lawrence A. L. Craig, James G. Dorsey, Leslie T. Figg, Jr., Clarence W. Gilmore, Robert A. Guy (With Oak Leaf Cluster), Leslie O. Hansen, William P. Hoben, Howell G. Hubbard, Charles E. Mayhugh. **STAFF SERGEANTS:** Elmer J. Alifano, Mark A. Battles, Sebron D. Bristow,

John D. Thomson. **SERGEANTS:** Francis L. Bennett, Warren Riley Bishop, Carl L. Bixby, Maxwell A. Blue, Gregory Bournazos (With Oak Leaf Cluster), Harold J. Brothers (With Oak Leaf Cluster), George A. Burke, Mervin C. Bush, James B. Cahley, Joseph F. Conchiglio, Thomas W. Crook, Jr., Jimmie N. Davis, Carmen C. Dimuzio, Clarence W. Durbin, Theodore J. Elfrink, William C. Fields James P. Fitzgerald, Jr., Curtis N. Foster, Zane A. Gemmill, Graham C. Hancock, Donald R. Hardwick, Willis D. Harris, Franklin P. Hohmann, Claude D. Hooks, Jerry D. Johnson, Donald L. Kerns (Also Oak Leaf Cluster to Silver Star), Robert Knight, Alton D. Lehman, Henry T. Lukowski, Peter G. Lupica, Theodore J. Nastal, Carl C. Nelson, Stanley E. Nichols, John L. Nixon, Edgar L. Phillips, Morris T. Quate, Louis L. Romanelli. **CORPORALS:** Herman C. Detwiler, William M. Donahoo, Charles R. Dunn, Salvatore L. Ferraro, William E. Filgo, Irving W. Krause, Edward M. Lemons, William Malone, Andrew C. Mitchell. **PRIVATES FIRST CLASS:** Donald J. Raher, Charles H. Seltzer, William T. Wimbish. **PRIVATES:** Jack Holloway, Stanley A. Douglas, Philip O. McGovern, Jodie B. Thornell.

OAK LEAF CLUSTER TO AIR MEDAL

MAJOR Donald J. M. Blakeslee. **CAPTAINS:** John L. Ryan, Reynold A. Soukop. **LIEUTENANTS:** Jack Cohen, William J. Crumm, Harold E. Snider, Ashley C. Woolridge. **TECHNICAL SERGEANTS:** Karl L. Masters, Robert G. Mumaw. **STAFF SERGEANT** Harold F. Lightbown. **SERGEANT** Bernard Jurosek. **CORPORAL** Jack E. Leverone. ☆





What's wrong with this picture?

HERE we go again, mechs. Gather 'round and pick out the boners. A fighter plane is pictured this month and it seems that there are a number of things happening to this P-39 which aren't strictly according to T.O.s. You should be able to spot the mistakes as easily as shooting fish in a barrel.

Naturally at advance bases in combat theatres and often in extreme emergencies in the United States, you'll find it necessary to improvise and use the ingenuity that makes AAF mechs supreme in their job. But as long as you can, it pays to use the right tools and methods for the job; those skillful tricks used of necessity in the combat theatres can only

be done by mechs who knew how to do things the right way in the first place.

This month's picture was posed by men of the 88th Repair Squadron, Air Service Command, Patterson Field, Fairfield, Ohio. Left to right, they are Private First Class Joseph Buffamonte, Staff Sergeant Peter Kasprzyk, and Privates First Class Frank J. Cussio and Gene Rankin.

They deliberately acted out these boners in the interest of better maintenance procedures.

Crew Chief Kasprzyk can point out seven mistakes in the photograph. They are listed on Page 55. Can you find any more?

ON THE LINE

RU CONSCIENTIOUS ABOUT URs? . . .

Upon discovery of a failure in any part of an airplane it behooves the mech to report it. The reason for URs (Unsatisfactory Reports) is to eliminate trouble at the source, saving lives and planes as well as headaches for mechs ON THE LINE who have to cope with the defect. It's your responsibility to make use of URs.

What happens to the UR you fill out? It goes from your hands through a sub-depot, a depot or field unit to Air Service Command Maintenance Division engineers. It is studied by them in addition to getting careful scrutiny by manufacturers and AAF laboratories. Frequently action is taken by the Materiel Command if design or material is involved.

Of utmost importance, URs furnish necessary information to enable corrective measures to be developed. Without them, flaws and failures may go unheeded and are repeated. Complete statistics are kept on all URs and the number of failures reported often determines the action required. The clinic studying and adjusting the faults must have representative figures on which to base its study. See AAF Regulation 15-54 for complete information on URs.

So turn 'em in, men. Those URs are a vital AAF instrument.

MAINTENANCE AT BORINQUEN . . .

It is the boast of many engineering officers at Borinquen Field, Puerto Rico, that the base, if necessary, could completely break down and rebuild any airplane in the AAF.

There, at one of the principal stepping stones on the route to England, Africa, the Middle East, Asia and other points, they have to be ready to service or repair every American airplane flown by the United Nations. An enlisted man or civilian at Borinquen may be called on to work on an A-20, B-17, B-24, B-25, B-26, A-29, A-30, C-54, C-53, C-47, C-87 and heaven knows what else.

The big problem is to keep abreast of supply requirements. Parts and other stock needs are anticipated far in advance and flown from Air Service Command depots. At Borinquen they do both second and third echelon maintenance and operate on a 24-hour basis at all times. Chief concern is engines but they also

carefully check hydraulic and electrical systems, and, occasionally, even armor and armament.

Construction at Borinquen was begun in 1939 and the base was just about ready to operate when war broke out, having been through a period when it was little more than a tent city. In fact, experience gained there in handling maintenance work right in the open showed the feasibility of operating exposed to sun, wind and the elements.

Now there are several gigantic hangars with a German-designed roof, reinforced in a complicated manner, and supposed to be hurricane-proof and able to resist direct bomb hits.

Salt water corrosion is the great worry for mechs there, because the salt air causes corrosion in planes even when they are just parked.

Men at Borinquen recall many of the early planes to go through after the war started. These included LB-30s and B-17Es sent out to reinforce the 19th Bombardment Group in the Southwest Pacific.

Several hundred Puerto Rican civilians now work at Borinquen and have become quite proficient. They are naturally good with their hands. One, formerly an artist, is operating the plexiglas department. Another is a high-grade propeller expert and many others are skilled with fabrics.

Classes are scheduled constantly to keep all enlisted men and civilians acquainted with new developments, and training films are shown frequently.

A monthly maintenance roundup prepared in collaboration with the Air Service Command and the Technical Inspection Division, Office of the Air Inspector.

SHARPS AND FLATS . . .

We heard of a case in which a nail was found in the tire of an ambulance, ready—apparently—for emergency duty on the flight line. Drivers of crash trucks and ambulances ON THE LINE must make an inspection of their tires and running gear *immediately* upon arriving at duty posts. You might loll behind the wheel all day with nothing to do, but if an emergency comes up everything must click. When a crash truck or ambulance is needed, it is needed right now!

WHO'S HOARDING? . . .

At an AAF flying school using BT-13 aircraft, 21 tool assembly cam moving wrenches were found in storage. These wrenches are used on hydromatic propellers and no hydromatic propellers are used at that station. One wrench should have been issued to the transient aircraft crew, another to sub-depot engineering, and the remainder reported as excess equipment as outlined in AAF Regulation 65-2. Keep in mind that tools hoarded at one station probably keep planes grounded at another! ☆

THE TEN COMMANDMENTS

1. Thou shalt not turn propeller without checking ignition switches.
2. Thou shalt not warm up engines without wheel blocks.
3. Thou shalt not leave airplane without checking parking brakes.
4. Thou shalt not leave airplane without locking controls where applicable.
5. Thou shalt not start engines without seeing that crew is clear of propeller.
6. Thou shalt not taxi airplane if not qualified to do so.
7. Thou shalt not clean engines inside hangars with inflammable fluids.
8. Thou shalt not leave cowls where they will be blown away by other airplanes taxiing or warming up.
9. Thou shalt not use jacks without being sure of capacity.
10. Thou shalt not leave a job until a final check indicates that it is finished.



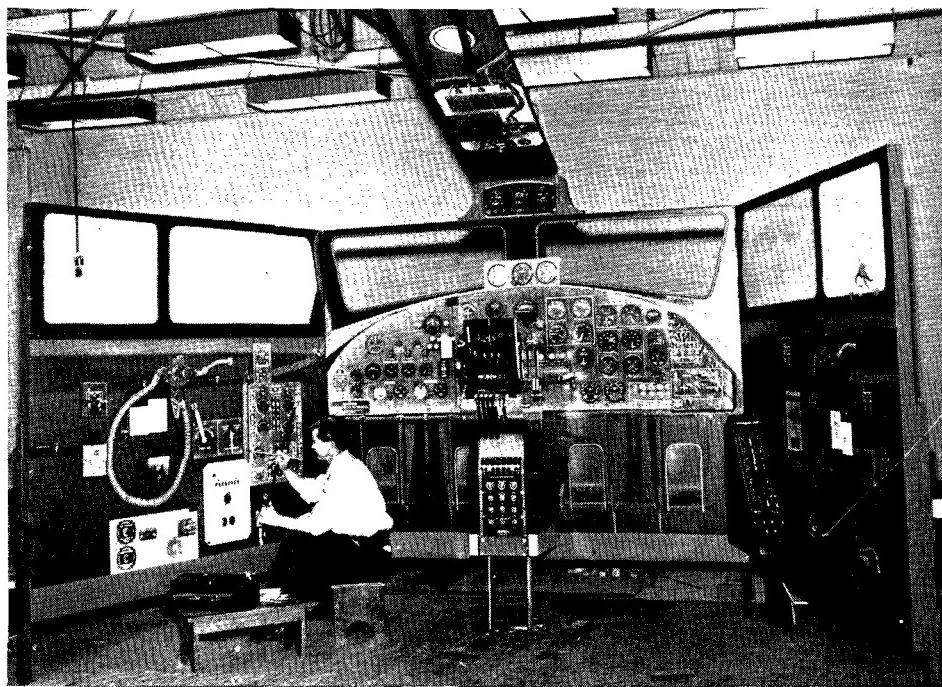
SYNTHETIC DEVICES

THE men who deal with synthetic training devices use the term "mock-up" to describe one broad category of their wares. Generally, it may be defined as a replica or facsimile model which looks and acts enough like the real thing so that the student may use it effectively for practice or study.

Hundreds of such gadgets are in effective use in the AAF training program. Some are made in local workshops of training activities, some are factory-built. Mock-ups used for practice by students usually are life-size models. Those in-

tended for demonstration or study may be reduced in size for easy handling or enlarged to permit effective demonstration to large classes.

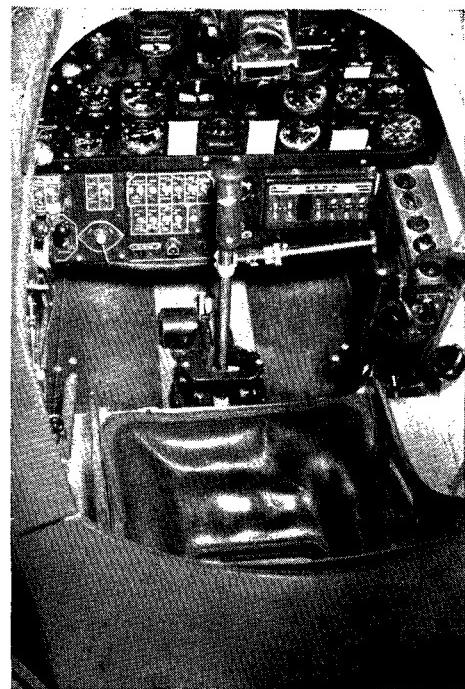
Typical of this type of training device are cockpit mock-ups in current use at AAF training stations. By using models of this kind instead of the real thing, students may be familiarized with specific types of airplanes without the necessity of grounding operational equipment. The three cockpit mock-ups described and shown on this page will illustrate the possibilities of such devices.

**B-17F Cockpit Instruction Panel**

THE B-17F cockpit mock-up shown here is actually a series of photographs, which have been enlarged and mounted on panels at appropriate points so that the whole set-up looks for all the world like a cockpit model.

The panels were designed to assist instructors at the Hobbs Army Air Field, Hobbs, N. Mex., in teaching pilots the operation and flying characteristics of the aircraft.

This method of instruction was designed and used originally at Luke Field, Ariz., about two years ago. Since that time, it has become widely recognized and many have suggested that it be made a standardized training procedure. This teaching method is supplemented by other mock-ups, charts, diagrams, training films, film strips and other training aids.

**P-40 Type Mock-up Instrument Trainer**

THE P-40 trainer shown here was developed by the AAF School of Applied Tactics, Orlando, Florida. Designed to orient new pilots, this cockpit has the regular P-40 instrument and switch panel, landing gear, landing flaps and cowl flap controls with functions simulating those in actual flight.

On the front of the trainer there is a complete set of controls so that difficulties in the flight of the trainer may be set up at any desired time. For example, the landing gear may be locked and the student required to make necessary correction. A fuel tank selector valve may be used to check the pilot in using the correct tank in take-off and landing.

**AT-6A Cockpit Mock-up**

CORRECT cockpit technique adds to the life of the airplane, engine and auxiliary equipment. To teach this technique and to provide a method by which the student may practice until good procedure is instinctive, the AT-6A panel shown here was devised.

In addition to the instruments, which simulate those of the aircraft, the student is provided an index and a set of publications for additional study.

WHERE TO GO

Information on the availability of training films and film strips, aircraft recognition materials, synthetic training devices and training literature may be obtained from the Training Aids Division, Army Air Forces, Park Avenue and 32nd Street, New York, N. Y.

THE AIR SERVICE COMMAND

(Continued from Page 42)

army. There is the task of welding all the arms and services together with Air Force personnel into a single organization. The training of such an activity is complicated by the different sources from which the men must be procured — the different sources of their technical training and technical control. If the magnitude and complexity of the ASC setup in the United States can be appreciated, then the great number of men required to perform the similar functions all over the world can be understood and the job of the personnel and training division in furnishing these men realized.

The establishment of the Command in

accordance with the principles under which it was reorganized was not without its problems. A general re-education of all the personnel was involved in order to get them to appreciate the difference between technical control and command control, on which straight-line organization is based. It took some time to convert officers to the fact that a committee was not a "bull session" or a conference but a temporary unit of organization, more analogous to a board in its type of action. It was difficult reconciling straight-line control with standard Army administrative procedures which are based on the concept of posts, camps and sta-

tions rather than on a division of activity by function, irrespective of where the function occurs.

In the end the Air Service Command has profited tangibly by its new organization. The number of planes out of commission due to lack of parts or proper maintenance by the ASC has decreased. The new organization has improved our overseas activities despite a lack of adequate overseas control. Considerable reduction in estimated personnel requirements has been accomplished.

The Air Service Command is now in full swing. It is realizing the capabilities of its personnel and the system of organization it has perfected—and these are being expressed in action everyday in AAF combat operations. ☆

AIR FORCE OPERATIONS IN THE BATTLE OF ATTU

(Continued from page 23)

In addition to its observation operations, Colonel Eareckson's Liberator joined other aircraft in strafing enemy positions. This naturally called for low-level flying, much of which had to be done through fog which billowed well below the 3,500-foot mountain ridges. Some of the beach recesses into which he flew his plane to reach stubborn enemy ground positions were just large enough to permit the B-24 to turn around without crashing into one of the vertical walls.

One of these recesses was behind Sarana Bay. About sixty Jap troops, with two trench mortars and two machine guns had stationed themselves behind a small embankment facing the beach to oppose any landing in that area. Despite a 200-foot ceiling which completely obscured the top of the ravine, Colonel Eareckson twice took his B-24 into the narrow recess, banking vertically around the Jap position and materially reducing its effectiveness with machine gun fire from the nose, waist and top turret of his plane.

Although enemy troops spotted in fox-holes were strafed occasionally from the air, the usual procedure was simply to make their position known to the ground commanders. In this way aerial observation aided considerably in reducing casualties caused by enemy snipers and in accelerating mopping up operations.

A striking example of the manner in which the element of chance enters into combat operations took place during the first days of the battle, when a small U. S. scouting force of some 350 officers and men who were attempting to cross a knife-like ridge in a flanking movement were observed from the command Liberator.

These troops had landed at Scarlet Beach and were working their way back of the enemy concentrations along Holtz Bay to come in from the rear just as our northern force attacked down the beach.

Observers in the command plane were aware that the scouting party was turning in too soon and was headed toward a deep, fog-filled ravine back of the west arm of the Bay. Late in the afternoon, a map giving proper directions was dropped for the troops, along with twenty parachute loads of food, medical supplies and ammunition dumped from another B-24. But the map was never received; it was found tangled in the tail structure of the command Liberator after it had returned to Amchitka.

The next day a B-24 carrying additional supplies went up to locate the party but it crashed on one of the fog-hidden peaks. On the third day, although they could not be seen through the thick fog, it was apparent that the troops had slid down the sides of the ravine and were facing the fire of the Japs who had them bottled up from the beach. Food and ammunition were dropped into the ravine through the fog until the little band was finally relieved by the advancing northern force which fought its way down the beach.

THAT little piece of paper catching in the tail of a B-24 had cost the scouts many casualties and the AAF an eleven-man bomber crew and a B-24, not to mention equipment and flying hours which might well have been spent in other phases of the operation.

This incident also serves as an illustration of the lengths to which our airmen went time after time in supporting the Attu landing. All air personnel participating in the operation did a magnificent job considering the handicaps encountered.

The work of the navigators and radio-men in taking the planes through the worst weather in the world and bringing them home again without a single major error on their part was superb. The pilots

flew extremely hazardous missions day after day with coolness and efficiency. Maintenance crews, who operated under anything but ideal conditions on the ground, kept the fighters and bombers in topnotch flying trim.

To the men of the Army Air Forces must go a large share of the credit for the success of an operation which reclaimed the first piece of American territory from the enemy in this war. ☆

MISTAKES IN "ON THE LINE" PICTURE ON PAGE 52

1. Let's get on the beam, men. You know a P-39 is always towed properly with a towing bar. Reference: T.O. 01-1-50. (Incidentally, consult T.O. Handbooks applicable to each airplane for the recommended method. When a rope is called for, its length should be three and one-half times the tread of the airplane. Reference: T.O. 01-1-50. The rope should not be around the scissors or tied with loose ends. See T.O. 01-110FB-2.)

2. What is this? The tire on the right landing gear is really soft—in fact, almost flat. Obviously this will break down the sidewalls of a precious rubber tire, and turning a corner will strain it even more. Reference: T.O. 04-10-1.

3. We don't like to keep harping on this, Sergeant, since other crews in previous pictures have made the same mistake. But, once more, no objects should be placed on the wings. This applies to those chocks you have there and also to the mech peacefully seated theron.

4. Wanted for safety: Men walking, one at each wing tip. We can't see the right wing tip but there's no one out at the left.

5. Say you, were you raised in a barn? The cockpit door is open, and it should be closed while the airplane is being towed. What's more, a man should be at the controls.

6. Oh, oh. One prop blade is pointing downward. Surely at least one of you four mechs knows that when towing an airplane with a three-bladed prop, one blade should always be at twelve o'clock.

7. And what about you two extra men on the tug? Did you come along just for the ride? If you don't have anything else to do, you could be out at the wing tip.



CAP cadets at Des Moines, Iowa. Upon graduation from high school, many CAP cadets enter the AAF for further training.

CAP AT YOUR SERVICE

(Continued from Page 47)

to fly emergency shipments where they are needed. Tracking missions to give practice in sighting to anti-aircraft gun and searchlight crews, tests of the aircraft warning system, camouflage inspections, blackout observations and other miscellaneous missions involve thousands of miles of flying each week.

Searches for lost Army planes are conducted by CAP as a matter of regular routine in many regions, especially in the west. Flying slowly and at low altitudes, with pilots and observers trained in methods of precision reconnaissance, the CAP puddle-jumper planes find what they are looking for. In one instance, wreckage was found by looking up rather than down. This Army plane had crashed along a canyon wall.

Many CAP squadrons have developed elaborate ground units with transportation, first aid and communications facilities. The Nevada Wing has formed some excellent cavalry units to go to the scene of accidents spotted in the mountains from the air; it also has motorized and foot auxiliaries. The New Hampshire Wing has ski units for the same type of missions. Michigan has parachute units.

The purpose of CAP has been to get ready for missions that will be useful to the Army Air Forces. Volunteer flights and squadrons in all parts of the country have drilled, trained and conducted practice missions so that every member will know what to do in emergency.

On many occasions when Army planes have been in distress, this CAP ground training has resulted in a safe landing for the aircraft. One evening in an Ohio town, a private pilot and his wife, both CAP members, heard a plane circling overhead. They notified the police and fire departments. A field was illuminated. They flashed landing directions with an auto spotlight in a code they had learned in CAP classes. After the Army pilot had landed, it developed that he had



Cavalry unit of the CAP Nevada Wing en route to search for lost Army plane.

been in CAP and had learned the Morse signaling that saved him from a crash.

The Coastal Patrols have made possible the rescue of more Army airmen than the total of their own losses. The survivors of the "ghost" plane which flew to Mexico after the crew bailed out off Florida were first spotted by CAP planes. Near a northern base, when an Army fighter pilot bailed out and was injured, his crashing plane set the woods afire. Skimming the tree tops through the smoke, CAP pilots located him just in time for a rescue.

BACK of these missions is the intensive training in military procedure, aviation and civilian defense subjects which is required for all members so that flying personnel will learn military discipline and ground workers will understand the fundamentals of flying. While CAP does not give flight training, its courses cover much more than the requirements of a private pilot's license. Members are encouraged to learn to fly at their own expense and thousands have done so in the CAP program.

Practice flying missions include area searching, bombing with flour bags, picking up messages and dropping supplies by paper parachutes. Mobilizations and maneuvers are practiced. Since there have been no enemy air raids yet, CAP units have not been called on for the home-guard duties for which they were originally formed. But many a squadron has shown what it could do by going into action during floods and other natural

disasters, performing aerial reconnaissance and relief duties as well as guard and labor tasks on the ground.

In addition to missions for the Army, CAP conducts extensive courier services for war industries. Often, by rushing in vitally needed supplies, the stoppage of assembly lines at war plants has been averted. Recently the departure of a fleet of Army trucks was delayed by lack of a shipment of tie rods. A CAP courier plane from Cleveland dropped the parts by paper parachute and saved many hours.

Through its training program and its detailed files of personnel, CAP has been able to furnish many specially qualified men on request from the armed forces; upwards of 15,000 of its members have gone into various branches of the service, including the Army, Navy and Marine Corps, as well as into flight and ground school instructor jobs and to the airlines.

CAP women members, comprising about ten percent of the total enrollment, have gone into the WAACs, WAVES and WAFFS. The commandant of the Marine Corps Women's Auxiliary, Major Ruth Streeter, is a former CAP officer.

CAP units in all areas are now engaged in a drive to find well-qualified aviation cadets for the Army Air Forces and encourage them to visit cadet examining boards. The CAP has its own cadets, in addition to its regular organization. Each local CAP squadron or flight is authorized to form a counterpart unit of cadets—boys and girls in the last two years of senior high school. Hundreds of these units, with a membership of approximately 20,000, have been formed. The young people get the same drill and training as the adults in CAP and are thus given a running start for military service.

CAP members are authorized to wear the Army uniform with red shoulder loops and silver CAP insignia as distinguishing features. Officers of the patrols and inland units are commissioned in CAP with ranks up to major.

Because these men who cannot go to war are doing their duty on the home front, there is reason to hope that the post-war development of aviation will be much more rapid than otherwise would have been the case. In addition to the big airlines and flying boats which will encircle the globe in peacetime commerce, it is predictable that a great network of feeder lines and air-mail pickup services, together with a great volume of private flying, will be developed with light planes, gliders and helicopters.

In the tens of thousands of aircraft which thus can be used there will be opportunities for many thousands of the demobilized members of America's military air services. That is one way in which CAP, by maintaining local air progress even in the grounded areas where civilian flying has ceased, is trying to do a service for every member of the AAF. *

LIKE A FIGHTING SQUADRON . . .



**AER IS ON THE ALERT
FOR YOU AND YOURS**

Army Emergency Relief is available at ALL times to ALL military personnel regardless of rank, grade, branch or component — and to their dependents, regardless of relationship.

AER may be consulted on all problems involving the personal affairs of a soldier and his dependents. When assistance or advice is needed, contact the Army Emergency Relief Officer at your station; dependents may apply at the nearest Air Force station, Army camp or direct to the Air Forces Branch of Army Emergency Relief, 703 Maritime Building, Washington, D. C.

Assistance may be in the form of a loan, cash grant or relief in kind, depending on the nature and worthiness of the case. AER will also aid in arranging for prenatal care and hospitalization of wives of Air Force men, for hospitalization of dependents, and for employment of dependents and discharged personnel.

**When in need of assistance...Contact
AIR FORCES BRANCH
ARMY EMERGENCY RELIEF**

Open YOUR CAREER TO AVIATION CADET TRAINING



Enlisted men between the ages of 18 and 26 inclusive (whose organizations have not been alerted for foreign duty) are eligible to apply for air crew aviation cadet training. An enlisted man interested in becoming a bombardier, navigator or pilot should submit his birth certificate and three letters of recommendation together with a completed application, Form 60, through his commanding officer. The application blanks can be obtained from C O's or from the nearest aviation cadet examining board, U S O club or recruiting office. Successful enlisted applicants who pass their mental and physical tests and qualify before the aviation cadet examining board are eligible to receive air crew training. (Officers below the rank of captain who meet the age requirements are also eligible to apply.)

Army regulations (AR 615-160) provide for transportation, at government expense, of enlisted applicants for air crew training to the nearest aviation cadet examining board to determine qualifications.



NOTE: Your seventeen-year-old friends who also would like to apply for this training may do so now by qualifying before an aviation cadet examining board. Successful applicants will be enlisted in the Air Corps Enlisted Reserve and called to active duty after reaching their 18th birthday.